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ANNUAL REPORT of the SECRETARY OF THE INTERIOR

for the FISCAL YEAR ENDED JUNE 30 1934

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ANNUAL REPORT

OF THE

SECRETARY OF THE INTERIOR

FOR THE FISCAL YEAR ENDED JUNE 30

1934

Reference Room
GENERAL LAND OFFICE
Department of the Interior

UNITED STATES
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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 30, 1934.

SIR: I have the honor to transmit my annual report for the Department of the Interior for the fiscal year ended June 30, 1934.

Very respectfully,

HAROLD L. ICKES,
Secretary.

The PRESIDENT,
The White House.

THE REPORT OF THE SECRETARY OF THE INTERIOR TO THE PRESIDENT FOR THE FISCAL YEAR ENDING JUNE 30, 1934

As in my first annual report, I will not attempt to interpret or give a resumé of the detailed reports of the various divisions, offices, and bureaus of the Department of the Interior contained herein.

Since my previous annual report there have been important changes in the organization of this Department. Among these was the transfer to this Department of the administration of the affairs of Puerto Rico. This was done by Executive order, the island having formerly been within the jurisdiction of the War Department. This transfer was subsequent to the period covered by this report, and since it was effected there has been organized in the Department the Division of Territories and Island Possessions. In this new Division are now grouped Alaska, Hawaii, the Virgin Islands, and Puerto Rico. The reports of the governors of the first three named will appear in separate form. Passage of the Taylor Grazing Act by the Congress necessitated setting up a new office in the Department, the Division of Grazing Control. This office did not operate for a sufficient length of time during the period here covered to justify inclusion of its early activities in this report.

As the President designated the Department of the Interior as the Federal agency responsible for certain administrative duties under the petroleum code, and as the Secretary of the Interior is the administrator under that code, the annual report of the Petroleum Administrative Board appears in this report.

Detailed reports of the many activities of this Department have been materially cut down in volume in this report for reasons of economy. Full particulars of the activities of any part of the Department are available in the files of the Department.

THE SOLICITOR

(Nathan R. Margold)

During the fiscal year ended June 30, 1934, for the first time, all of the more than 60 attorneys in the Department of the Interior, both in Washington and in the field, have been under the administrative jurisdiction of the Solicitor.

Centralization of responsibility and control has not resulted in loss of identity or any important change in the function of the legal sections attached to the several bureaus of the Department. It has seemed a requirement of organizational efficiency that so much of the business of each bureau as requires legal competency should be handled, in first instance, at least, by a legal staff assigned to that bureau and intimately and continuously associated with its work.

The central office of the Solicitor has continued to serve as the legal unit of the Office of the Secretary and as an agency for legal review of matters considered initially in the several bureaus of the Department.

The rendering of formal legal opinions for the Department is a growing and particularly important function of the Solicitor. The enactment of new legislation and the expansion of the activities of the Department have increased the number, the difficulty, and the importance of questions of law which must be decided for the guidance of departmental action. Among the 84 matters which have required formal opinion during the year are the following:

The creation of grazing districts by Executive order;

State taxation of Federal Subsistence Homesteads Corporation and its property;

The conduct of soil-erosion projects on privately owned land;

The pardoning power of the Governor of Alaska;

Wages and hours of labor on Public Works projects in national parks; and

The extent of the police power of the Park Service with respect to private lands in national parks.

The more important opinions will appear in the forthcoming volume 54 of the Decisions of the Department.

More than 500 appeals from decisions of the General Land Office and related motions have been disposed of during the year. While many of the contentions of homesteaders, lessees, and other persons claiming under the land laws are covered by earlier departmental decisions, an effort has been made in the adjudication of each appeal

to make clear the rationale of decision. Useful direction is thus furnished for future administrative action and individual claimants are better satisfied.

A significant innovation and one which has produced gratifying results, has been the establishment of a legislative section within the Office of the Solicitor. Two specialists have devoted full time to legislative work with assistance from other attorneys in whose particular fields legislative problems have arisen. In 884 instances report has been made upon bills introduced in Congress. More than 50 appearances have been made before Congressional committees. The preparation and successful promotion of the Taylor grazing bill and the Wheeler-Howard Indian bill have been major achievements. The development and regulation of grazing districts on the public domain, as provided for in the Taylor bill, will be of great benefit to the livestock industry and through that industry to the entire Nation. The Wheeler-Howard bill is an important first step toward building upon a sound economic and political basis Indian communities which themselves will provide a means for the justification of further emancipation from the status of wardship. The members of Congress have already come to appreciate the service of our experts and to rely upon this staff for accurate and pertinent information both factual and legal. Building upon the groundwork laid during the last session of Congress the legislative section of this office can and will be of increasing usefulness during future sessions.

While the legal officers of the Department, both in Washington and in the field, have cooperated with the Department of Justice in the prosecution and defense of suits filed outside of the District of Columbia, the responsibility of the Solicitor for the representation of the Department before the courts has been limited to some 20 suits in the District of Columbia, wherein officers of the Department have been parties litigant in their official capacity. Individual cases have involved large money claims or large property interests, and occasional issues of general significance have been adjudicated.

Without further particular reference and in brief statistical resume, the year's work of this office, exclusive of matters disposed of by the legal sections attached to particular bureaus, is summarized in the following table:

	Public-land matters		Indian matters	Miscellaneous matters
	Appeals	Motions		
Pending July 1, 1933	410	16	22	13
Received during year	462	58	8,885	12,147
Total	872	74	8,907	12,160
Disposed of during year	473	66	8,737	11,083
Pending June 30, 1934	399	8	170	[1] 1,077

[1] The number of miscellaneous matters pending on June 30, 1934, was large because about 750 oil- and gas-permit applications were held suspended pending consideration of a change of policy.

"Miscellaneous matters" include the following:

Formal opinions by the Solicitor	84
Reports on legislation	884
Contracts for the erection of buildings, road construction and repairs, supplies, etc	2,286
Cases prepared for submission to the board of equitable adjudication	682
Oil and gas matters:	
Leases	37
Prospecting permits:	
Granted	907
Reinstated	9
Assignments	153
Extensions of time	1,443
Canceled	231
Coal matters:	
Prospecting permits	58
Licenses	26
Leases	31
Potash matters: Prospecting permits	14
Sodium matters: Prospecting permits	19
Sulphur matters: Prospecting permits	22

Outside of the central office, the development of reclamation projects and Indian irrigation projects under Public Works allotments has involved the acquiring of land, rights-of-way and miscellaneous licenses for new projects, contracting for construction, organizing water users and obligating them under appropriate repayment contracts. Moreover, it has been necessary to take cognizance of the water laws of the several Western States and the interrelation of Federal and State law in the planning and development of local and interstate projects. The detail of contracting for expenditures on projects and for repayment by water users has been particularly important because of the large sums involved. The legal safeguarding of the interests of the Government in transactions involving hundreds of millions of dollars has been a responsibility of this office. In one of the six reclamation districts alone 1,133 contracts involving $24,944,966.68 have been executed.

The administration of estates of deceased Indians is an important legal service performed partly in the field and partly in Washington. The courts have no jurisdiction over Indian estates, except among the Five Civilized Tribes and the Osages in Oklahoma. Substantive problems of marriage and adoption according to Indian customs are being made a subject of revised regulation; the procedure for filing and allowing claims against Indian estates is being improved; causes of delay in the administration of estates are being removed wherever possible and a proper basis for the allowance of fees to private attorneys is being determined. No effort is being spared to make the Federal system of administration of Indian estates a model of efficiency for its intended purposes.

The organization and conduct of subsistence homestead enterprises authorized under section 208 of the National Industrial Recovery Act has presented important and difficult legal problems. The brief, general provisions of section 208 have required frequent interpretation. The conduct of the enterprise under Federal statutes and administrative practice with reference to the acquisition of property, the letting of contracts and the conduct of operations generally, adopted in the light of traditional functions of the Government, has not been simple. In fact, it is difficult to imagine a more thorough test of the adaptability of the machinery of Government under existing law than the subsistence-homestead venture has presented. Moreover, the conduct of these federally sponsored and controlled projects in the several States has involved significant problems of Federal and State jurisdiction.

DIVISION OF INVESTIGATIONS

(Louis R. Glavis, Director)

The appropriation for the General Land Office for the fiscal year 1934 was $400,000. Of this sum $60,000 was to be used for prevention and suppression of forest and other fires on the public lands, and for no other purpose, leaving the net sum of $340,000 for the prosecution of routine work, but due to the President's limitation of cash withdrawals only $300,000 was available for this service.

The average number of active field investigators, exclusive of 4 special agents in charge, was 72; average number of clerks employed in divisional offices, 20; total force employed, including special agents in charge, 96, exclusive of the Washington office.

Due to the activities of field investigators, $70,794.28 was collected and turned into the Treasury and 216,757 acres were restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

Investigations.—On July 1, 1933, there were pending field investigation 11,552 cases. During the year 11,150 additional cases were received; 14,226 cases investigated, reported and closed, leaving 8,476 pending investigation, which is a material reduction in the number of routine cases. Of the reports submitted, 3,133 were adverse and 10,195 favorable, and in addition reports submitted showing 898 cases closed without field investigation.

On the recommendation of this Department civil suits were brought by the Department of Justice. Twenty-three cases were tried, of which 18 were won and 5 lost. As a result of the suits $47,147.12 were recovered and 560 acres restored to the public domain. Offences against the public land laws were responsible for seven indictments. Of the criminal cases tried 6 resulted in conviction and prison sentence was imposed in 4 cases. Fines were paid in the sum of $3,800.

Attorneys and agents.—The number admitted to practice before the Department for the year ending June 30, 1934, was 25.

The appropriation for Protecting public lands, timber, etc., 1934, included $60,000 for prevention and suppression of forest and other fires on public lands, to be available for this and no other purpose. No expense was incurred under this appropriation.

There were also investigated and closed in this Division the following cases: Homestead entries, 1; coal trespass, 1; fire trespass, 2; timber trespass, 7; official conduct, 2; unlawful inclosure, 19; criminal, 17; conspiracy, 19; miscellaneous, 37.

The Division investigated and closed 1 miscellaneous case for the Office of Education, and 1 official conduct and 2 miscellaneous cases for the Geological Survey.

The cases investigated and closed for the Office of Indian Affairs were: Official conduct, 30; criminal, 11; miscellaneous, 56.

The cases investigated and closed for the National Park Service included: Official conduct, 3; miscellaneous, 2.

The cases investigated and closed for the Bureau of Reclamation involved: Appraisal of lands, 1; official conduct, 4; miscellaneous, 5.

There were also investigated and closed 13 miscellaneous cases.

FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

Organization.—The investigational work for the Public Works Administration was assigned to the Director of Investigations for the purpose of having the benefit of the services of an enlarged trained personnel without the expense of setting up an entirely new additional office force.

Personnel.—The number of employees, including Washington office, was: 9 special agents in charge; 1 acting special agent in charge; 130 special agents and 74 other employees.

Nature of cases.—The cases investigated, relating to the expenditure of Public Works funds, consisted of collusive or fraudulent bidding, involving contractors and subcontractors; wage rates and disputes; labor and materials; code violations; underpayment of wages to employees; repayment to contractors of wages of employees; contracts relating to housing projects; and misconduct of officers and employees of the Public Works Administration, National Reemployment Service and other governmental agencies, allotted Public Works Administration funds. The investigations concerned the expenditure of large sums of money and the disclosure of facts resulted in a substantial saving to the Government.

Investigations.—During the year 3,536 cases were investigated and reported. Of this number, 2,389 cases were reported adversely and 1,747 cases were reported favorably.

Court action.—On recommendation of the administrator, 119 cases were criminal prosecutions, resulting in 34 cases receiving court action; 17 cases resulted in indictments; and prison sentences were imposed in 3 cases.

CIVIL WORKS ADMINISTRATION

Organization.—Both for efficiency and economy, under the immediate supervision of the Public Works Administrator, and because Public Works Administration funds were allotted to the Federal

Relief Administrator for civil relief, the investigations of irregularities in expenditure of such funds were conducted temporarily by the Director of Investigations.

Investigations.—The cases investigated embraced a total of 417, of which 234 cases were favorably reported and 183 were adversely reported. There were 38 cases pending with the United States Attorney for prosecution; 12 indictments were secured; 9 cases resulted in court action; 3 cases involved prison sentences and in 1 case sentence was suspended.

A number of important investigations relating to other emergency bureaus, were, by request, made by the Division of Investigations.

OIL ENFORCEMENT

Organization.—The Secretary of the Interior, in his capacity of Oil Administrator, by virtue of authority of Executive orders of July 11 and 14, 1933, designated the Director of Investigations to conduct all investigations in the enforcement of the provisions of the regulations under 9c of the National Recovery Act, and the provisions of the Code of Fair Competition for the Petroleum Industry.

"Hot-oil" cases.—The establishment of two offices of the Department in the vicinity of oil flush pools in Texas and Oklahoma, with a personnel of 1 acting special agent in charge, 36 special agents, and 4 clerks, was designed to prevent the transportation of oil produced in excess of proration orders of the States. A large number of cases was investigated; 320 cases are now pending; 59 cases are also pending in office of United States Commissioner awaiting action; 3 cases are before the United States Supreme Court for decision; 17 cases were dismissed by court order; 5 cases were reviewed by the Supreme Court of the State of Texas and 1 case resulted in conviction.

Tax evasions.—The Director of Investigations, under the immediate supervision of the Secretary of the Interior, by means of a marine unit, consisting of eight employees, operates a number of picket boats to investigate incoming tanker cargoes of petroleum and petroleum products to determine their origin. The information obtained forms an important aid in the enforcement of the regulations under 9c of the National Industrial Recovery Act, as well as being of valuable assistance to the States and the United States in the collection of taxes due and collectible on the petroleum products in transit to their actual destinations. Reports received from tax officials of several States indicate their appreciation of the cooperation given by this Department.

Oil code.—The personnel of the Division of Investigations for the enforcement of the oil code consisted of 10 special agents in charge, 7 acting special agents in charge, 97 special agents, and 55 other

employees, inclusive of the personnel at Washington. The cases investigated include a total of 7,263, of which 5,686 cases were reported on and closed. Of the total number of cases investigated, 252 were recommended for prosecution by the Secretary of the Interior; 133 cases of this number were authorized for prosecution by the Attorney General; and 21 cases are involved in court actions.

WAR MINERALS RELIEF COMMISSION

(Roscoe Fertich, Commissioner)

The War Minerals Relief Act, section 5 of the act of March 2, 1919 (40 Stat. 1292), as amended February 13, 1929 (45 Stat. 1166), authorized claimants to petition the Supreme Court of the District of Columbia for review of the decisions of the Secretary of the Interior upon questions of law, but provided that "the decision of the Secretary of the Interior on all questions of fact shall be conclusive and not subject to review by any court."

The Secretary of the Interior, acting under a decree of the Supreme Court of the District of Columbia in each instance, made 25 awards, 3 disallowances, 1 additional award under amendment, and 1 award on rehearing of a former denial, during the fiscal year ending June 30, 1934. These awards were certified to the General Accounting Office and were paid through the Treasury Deficiency Appropriations bill (Public No. 412, 73d Cong., 2d sess.) in the amount of $589,231.13.

Record of cases filed under the act as amended Feb. 13, 1929

Total cases filed		348
Total cases dismissed by court on hearing	4	
Total cases dismissed for duplication of petitions	10	
		14
Decisions by Secretary of Interior:		
To Mar. 4, 1933	107	
Mar. 4 to June 30, 1934	4	
July 1, 1933, to June 30, 1934	28	
		139
Cases pending:		
In Supreme Court of District of Columbia	154	
In United States Court of Appeals, District of Columbia	1	
		155
Decrees by Supreme Court of District of Columbia, pending in War Minerals Relief Commission on June 30, 1934		40

COURT DECISIONS

During the present fiscal year the Supreme Court of the United States sustained the opinion of the Secretary of the Interior that separate operations by a single claimant should be considered as one under the War Minerals Relief Act.

The United States Court of Appeals for the District of Columbia, in the Cuyuna Mining & Investment Co. case, sustained an opinion by the Supreme Court of the District of Columbia which held the

benefits accruing under the War Minerals Relief Act were gratuities and not legal claims against the Government. The motion for review of this decision is now pending in the Supreme Court of the United States. The decision by the Supreme Court of the United States will have a direct bearing upon a great many of the pending cases.

The United States Court of Appeals for the District of Columbia sustained the opinion of the Secretary of the Interior that expenses incident to incorporation, stock sales and commissions, and discount on securities were not, as matter of law, allowable items under the act. Time limit for motion for review of this decision by the Supreme Court of the United States has not expired.

PETROLEUM ADMINISTRATIVE BOARD

(NATHAN R. MARGOLD, Chairman)

SUMMARY

By Executive Order No. 6204 the President designated the Secretary of the Interior to administer section 9 (c) of the National Industrial Recovery Act and to enforce Executive Order No. 6199 prohibiting the shipment in or affecting interstate commerce of oil produced in violation of State law. By Executive Order No. 6260–A the President further expanded the powers of the Secretary of the Interior with respect to the petroleum industry by designating him Administrator of the Code of Fair Competition for the Petroleum Industry. He further empowered the Department of the Interior to act as Federal agency as provided for in the code. Section 2, subsection (b) of title I of the National Industrial Recovery Act empowers the President to create agencies necessary to carry out the policy of the act. The Petroleum Administrative Board is an agency created by the Administrator on behalf of the President to make effective provisions of the act so far as it applies to the petroleum industry. Its duties may be briefly summarized as assisting, advising and representing the Administrator with respect to matters incident to the administration of the Petroleum Code and to the enforcement of the regulations issued by the Secretary of the Interior under section 9 (c) of the act and the President's orders authorized thereby.

Throughout the life of the code representatives of the petroleum industry have constantly urged upon the Administrator various actions designed to obtain for the industry benefits intended to be conferred upon it by the National Industrial Recovery Act. Changes in the code have been proposed in order to make it a more effective instrument in the stabilization of the industry. Agreements have been submitted pursuant to title I, section 4, subsection (a) of the act. Studies have been commenced both by the industry and by the Board with a view to ascertaining the effect of the code and the act upon various units within the industry and with the further purpose of obtaining a picture of the economic processes of producing, refining, and distributing petroleum and its products, so that a basis may be laid for such further action as may seem advisable.

In dealing with any and all of these problems the Board has served a dual function. First, as a court of review to which complainants against particular rules or proposals may present their case, and secondly, as an advisory body charged with the duty of presenting to

the Administrator recommendations upon each specific proposal, based upon impartial technical and legal considerations.

Since the code includes within itself a broad sweep of the industrial and business processes surrounding the production and marketing of crude petroleum, it was inevitable that in the drafting there were some omissions of the essential provisions, inconsistent and conflicting provisions, and provisions which required modification and relaxation.

In the first year of the code, as the industry gained experience in its operation, it has been found necessary from time to time, after due investigation and hearing, to modify and to amend provisions of the code. With a few possible exceptions, depending upon future course of events, this process is now over. By this process of amendment, modification, interpretation, and regulation the code has taken on a well-rounded form, and with but slight changes hereafter should govern the industry for the duration of the National Industrial Recovery Act.

The Board has been requested to consider many plans directed toward stabilization of the petroleum industry. These plans generally aim at the attainment of a normal price level for petroleum and its products either nationally or in local areas. Their purpose has been to supplement the code so that the industry may be more readily able to bear the burdens imposed upon it by the act. Proposals have been many and varied, and have ranged from outright price fixing by governmental fiat to local agreements providing for the shutting off of supplies from violators either of the code or of local price agreements.

Section 6, subsection (a) of article III of the code, as modified on September 13, 1933, provides for the establishment of minimum prices based on cost recovery. Early in September 1933, the Planning and Coordination Committee submitted to the Administrator a comprehensive schedule of minimum prices for petroleum and its products from the well to the filling station. The board, in a report to the Administrator, pointed out that this schedule presented numerous technical and legal difficulties, and that the evidence used in supporting it was insufficient to justify the price levels proposed. The Board further recommended that due notice be given and a public hearing be held at which protestants against the proposed schedule might make their objections known. On November 20, the Planning and Coordination Committee requested the postponement of the effective date of the schedules until some later date so that due consideration might be paid to alternative proposals submitted by certain interests within the industry opposed to the schedules in principle, and to certain of its items in detail. By an order dated January 31, 1934, the price-fixing program was indefinitely canceled.

On December 7, 1933, the Planning and Coordination Committee submitted on behalf of itself and of various companies among the industry two complementary agreements, the National Purchasing Agreement and the National Marketing Agreement. They were designed to stabilize refinery, wholesale, and retail prices of gasoline, and assure protection to the small semi-integrated or nonintegrated refiners, and to the various types of distributors.

When these agreements were submitted to the Administrator they were released to the trade journals, trade associations, and to the press. Copies were sent to all parties who had recorded an opinion upon the price-fixing order for which the agreements were designed as a substitute. In accordance with the provisions of the National Industrial Recovery Act that "Nothing * * * shall deprive such persons of the right to be heard", hearings, conferences, and discussions were held on behalf of and with each protestant and commentor who desired to be heard.

After a thorough investigation of the agreements and the protests made regarding them, the Board prepared a memorandum setting forth certain conditions which it believed necessary to protect the interests of independent refiners and distributors, and to enable the agreements to comply with the requirements of the act that the order should not tend toward monopoly or operate to discriminate against small enterprise. These conditions were designed mainly toward strengthening the provisions concerning the elimination of lease and agency, lease and license agreements, and exclusive dealing contracts, toward providing for flexible administration of the provisions relating to margins and modification of the resale price-maintenance provisions, and to make possible the allowance of differentials to marketers who required such preferential treatment in order to remain in business.

The industry embodied the conditions to the Marketing Agreement within the redraft of the agreement and resubmitted it to the refiners for signature. Meanwhile, in March the agreements were submitted to the Department of Justice for analysis and approval. On June 27 the Attorney General notified the Administrator that the Department of Justice did not approve the agreements because they disagreed with the theory of notice and hearing under which they were promulgated.

Meanwhile, conditions in the petroleum industry have changed in many ways for the worse. In many areas the price structure is more chaotic than it has been for several years. Many companies, no longer willing to guarantee margins for retailers under such conditions, have withdrawn from participation in the agreements. Consequently, in all probability the agreements are now, after the delay, a dead letter.

Because of peculiar competitive conditions on the Pacific coast, disastrous price wars have raged throughout that territory. In an attempt to rationalize the industry by coping with the problem of over-capacity, the California industry proposed a cartel which assured all refiners an adequate supply of crude, a fair share of the gasoline market based upon their historical and current record of sales, and provided adequate margins and stabilized prices for the retail trade.

The Department of Justice, as a condition of the approval by the court of the agreement, insisted upon conditions which the industry found itself unable to assume. Immediately negotiations by the industry were begun to draft a new agreement which would be satisfactory to the Department of Justice, spurred on by a complete collapse of the price structure on the Pacific coast, involving a loss of millions of dollars, and ascribed by the industry to the failure of the cartel. As in other cases, this action was given wide publicity by the trade journals and newspapers and through trade associations. All refiners in the territory involved were contacted and all but one signed a new marketing agreement, which was submitted to the Administrator for approval.

When the agreement was submitted to the Administrator and the Department of Justice for consideration, notice was given by widespread publicity in the trade journals and newspapers throughout the Pacific coast and through trade associations. Such complaints and protests as were filed were duly considered. The Department of Justice, after a prolonged consideration, was willing to permit the agreement to become operative under the consent decree, provided the participants entered into a supplemental agreement, agreeing to abide by the provisions of the code and not to engage in monopolistic practices. The supplemental agreement was duly prepared and signed, and the Pacific Coast Petroleum Agency Agreement became effective June 23, 1934.

Under it an agency has been set up to take over distress supplies from small refiners. Prices have been stabilized, refiners have been afforded adequate crude supplies and a fair share of the market calculated from their past sales records and their current performance. Under the provisions of the agreement there is no price differential between the major and the affiliated companies and independent companies are selling their gasoline at the same price as the major and affiliated companies' third-grade gasoline.

The agreement provides for a representative of the Administrator, at present an attorney for this Board, to assist the executive committee of the refiners and the agency in the determination of problems arising under the agreement. At the suggestion of the Department of Justice, there is also to be organized a public committee of three to hear such complaints as may arise in connection with its

operation. It is believed that the market in California will be stabilized through the operation of this agreement, and that adequate administrative safeguards have been provided to prevent discrimination against any small enterprise.

Following upon the virtual failure of the national-purchasing agreement and the national-marketing agreement, proposals were made for the purchase by individual buyers of distress gasoline to meet temporarily the problems of excess crude production, and to bring about some adjustment between the wholesale price of gasoline and the price of crude petroleum. The disproportion existing between these prices has proven to be one of the major elements of instability in the marketing structure, and has been caused in large part by the presence upon the market of gasoline manufactured by small refiners located in and around the East Texas field from illegally produced crude petroleum. This gasoline has operated as a depressing factor upon an already abnormal market. Certain companies within the industry desired to purchase such gasoline in order to permit of its orderly liquidation, but did not wish to do so until they could be assured first that no gasoline would be produced in the future from illegally produced crude oil, and secondly, that such gasoline as was purchased would be cleared from the taint of illegality in the interests of conservation and stabilization. The Administrator on June 23, 1934, approved a form of contract to be used by such buyers, drafted after conferences between the Planning and Coordination Committee and the Petroleum Administrative Board. It is expected that this form, when generally used, will afford at least partial relief to what is at present a very distressing situation.

For a number of years the Petroleum Economics Division of the Bureau of Mines has assembled, analyzed, and published statistics on crude-oil production and stocks, as well as the production stocks and indicated demand for motor fuel and other petroleum products. The new reports which have been inaugurated under the administration of the Petroleum Code are a weekly report of crude petroleum stocks held by companies holding 100,000 barrels or more, a monthly report showing the interregional movements of crude petroleum, as well as the distribution of shipments by pipe lines, tankers, tank cars, and trucks, and a new natural-gasoline report showing interstate movements and classes of utilization. The weekly crude-oil stocks report and the monthly report on interregional movements of crude petroleum are published separately by the Petroleum Administrative Board.

The basis of the Petroleum Code is article III, providing means for the control of production. Section 3 of this article provides that the production of crude oil must be balanced by consumer

demand for petroleum products. Under the terms of the code and President's Executive Order No. 6260–A, the Petroleum Administrative Board, as Federal agency, estimates at intervals the required production of crude oil and allocates it equitably among the several States, due account being taken of expected withdrawals from storage and of anticipated imports. The required production so estimated has been allocated equitably to the several States, and upon approval by the Administrator, has been certified to the several States as the net reasonable market demand for crude petroleum therefrom.

The subdivision into pool, lease, and/or well quotas is made within the State. In the States of Texas, Oklahoma, and Kansas, each of which is provided by State law with a regulatory commission, the approved allocations have been certified with the Texas Railroad Commission, the Oklahoma Corporation Commission, and the Kansas Corporation Commission, as the net reasonable market demand for the crude petroleum in those States. These estimates have afforded the basis upon which allocations have later been made to individual operators of the production which they are permitted to utilize pursuant to law. The State of Montana, by an act of its legislature, approved on December 29, 1933, an oil-conservation board to be established to have general control, regulation, and supervision of the production, transportation, and storage of crude petroleum within that State. Similar legislation is expected to be enacted in the State of Louisiana.

In the making of production allocations, a continuous effort has been made to provide a proper balance in refining operations and as nearly a uniform rate of operation throughout the seasons as possible. The allocation among the several States has been based principally upon the customary and established channels of trade for the movement of crude petroleum and petroleum products between producing and consuming regions. Special studies also have been made relative to the demand for crude petroleum from newly developed producing areas.

In general, the effect on crude-oil production of operations under the Petroleum Code during the 10 months ended with June 30, 1934, has been a more equitable distribution of output among the several States than was possible of achievement under conditions which existed prior to the effective date of the Petroleum Code.

The statistical position of the refining branch of the industry was essentially unbalanced, and it became evident that a lack of normal relationship between refinery gasoline prices and field prices for crude petroleum was rendering impossible the profitable operation of petroleum refineries, particularly the nonintegrated and semi-inte-

grated refineries which buy all or a major portion of their crude petroleum supplies at the posted field prices.

The Board, therefore, recommended to the Administrator certain provisions designed to control the operations of refineries, both with respect to stocks on hand and production of gasoline. An amendment to the code was thereupon submitted to the industry, a public hearing was held, and after conferences subsequent thereto, an amended article IV was submitted to the Petroleum Administrator, which amended article received the unaminous endorsement of all affected parties within the industry. This amended article, approved on April 24, 1934, and actually effective June 1, 1934, provides for a joint governmental and industrial organization to determine the proper inventories of gasoline for each district and the production of gasoline in each district necessary to meet the demand therefor.

The provision relating to orderly development of new pools is in its implications one of the most far-reaching provisions in the code, since it establishes a basis upon which any petroleum product may be properly conserved and the wastage incident to development in recent years eliminated.

Plans for the orderly development of new petroleum pools, submitted in compliance with section 7 of article III of the Code of Fair Competition for the Petroleum Industry, totaled 336 as of June 30, 1934. Of this number, 239, or approximately 71 percent, have been approved by the Petroleum Administrator. Of the 336 plans submitted, 18 were determined to be not new pools as defined by the new-pool regulations.

In approving the development plans, the problem of well spacing was given careful consideration. Wider well spacing than has hitherto been customary was one of the principal objectives, as a most effective means of obtaining the most efficient utilization of reservoir energy and of combating overproduction.

The Petroleum Administrator on December 20, 1933, authorized a study of the economic recovery cost of crude petroleum covering the 3 calendar years 1931, 1932, and 1933. The Administrator's order directed operators producing in excess of 5,000 barrels per annum in the eastern and Rocky Mountain areas, and 10,000 barrels per annum in all other States, to furnish the Petroleum Administrative Board the necessary data from which summaries could be made showing costs and other related information by States and pools within each State. Final analyses are now being made, and the report on the costs of production will be made public shortly.

The marketing division of the Board has worked constantly with the marketing subcommittee of the planning and coordination committee in an endeavor both to make article V, dealing with marketing, comprehensible and to adjust such of those provisions as appear

to be working undue hardship. Its activities in this regard are set forth in detail below. The marketing division has also aided in the collection of certain statistical data essential to obtain a proper picture of the costs of marketing, and has cooperated in the consideration of the various stabilization plans which have been proposed.

A major problem was presented to the Board early in its existence in the necessity under rule 19 of taking some action with reference to lease and agency, lease and license agreements, and other forms of exclusive dealing contracts. Agreements of this character provide the refiner or distributor of gasoline with a controlled outlet whereby he can maintain an assured portion of the market. In consequence, they tend to discriminate against the products of independent marketers and possibly are in contravention of the fundamental provisions of the National Industrial Recovery Act.

The national marketing agreement, referred to elsewhere in this report, provided for the eventual liquidation of all such agreements. With the failure of the national marketing agreement, the Board conducted an independent study of this matter, and requested the Planning and Coordination Committee to forward a recommendation for a modification of the code substantially similar to that contained in the national marketing agreement. Action upon this recommendation is expected shortly.

Overproduction of crude oil, excessive refining capacity, and excessive production at refineries has produced surplus and distress stocks of gasoline which have had a serious, depressing effect upon the market. The overexpansion of retail outlets by reducing the gallonage per station increases unit costs and leads to price cutting to obtain individual volumes. With less gasoline consumed today than in 1929, but with perhaps twice as many stations, and with surplus stocks, the stabilization of markets to preserve small enterprises and to permit the paying of code wages and maintenance of code hours has proved essential.

The conflict between the distributors selling at the regular price and those selling with a cut-price policy has been the most frequent immediate causes for price wars. Because of the complexities of the factors involved and the clash of policy, it has not been possible to determine a "right solution" for such conflicts. Therefore, the Petroleum Administrative Board has encouraged negotiations and discussions between all the parties involved in a price war on an experimental basis in an attempt to work out a technic for stabilizing markets.

There is no question but that some action must be taken to curb overexpansion of retail outlets. It is estimated that there are now approximately 350,000 service stations in the country. This number is far in excess of the number required to serve the consuming public.

This total has been reached in recent years, and represents a large increase, due partly to the marketing policies of the large refiners and partly to the pressure for outlets for production from new pools. The increase in stations has greatly diluted the gallonage throughout for each outlet with a twofold result: Overhead costs have greatly increased, and an oversensitive market structure has been created since the slightest decrease in volume in individual outlets induces market breaks, which creates vicious price wars. It is obvious that any program directed toward the solution of the evils with which the industry is faced must include an equitable solution of this problem.

It was early recognized that the success of the administration of the code depended upon vigorous enforcement of the production allocations and of the provisions regulating marketing practices. The program for enforcement involves complex and fundamental questions in constitutional law, combined with problems of proof of the interstate character of the petroleum industry. Members of the staff of the Board, trained in the legal problems involved, were designated as special assistants to the Attorney General, to cooperate with the United States attorneys in litigation involving the Petroleum Code and the regulations promulgated under section 9 (c) of the National Industrial Recovery Act. Representatives of the Board were usually in charge of the cases and prepared the briefs and argued the cases. In June, in accordance with the general policy established by the Department of Justice, the responsibility for litigation was undertaken by that Department. Hereafter, cases will be conducted by the United States attorneys. The legal staff of the Board stands ready to assist local United States attorneys upon call in preparing and prosecuting cases.

The first attempt to enjoin the enforcement of regulations promulgated under section 9 (c) was defeated in the Supreme Court of the District of Columbia in *Southport Petroleum Co.* v. *Ickes.* In *Panama Refining Co.* v. *Ryan* an injunction was obtained from Judge Bryant in the eastern district of Texas, against the enforcement of the regulations promulgated under section 9 (c) of the National Industrial Recovery Act. In *Amazon Petroleum Co.* v. *Ryan* a three-judge Federal court found that the orders of the Texas Railroad Commission limiting the production of oil in the exercise of its statutory power to prevent waste were not void on the theory that they were dictated by the Federal Oil Administrator. The court held it had no jurisdiction over Federal questions involved and those aspects of the case were assigned to the Federal district judge, Judge Bryant, who promptly issued an injunction against the enforcement of the production provisions of the code and the regulations under 9 (c). Upon appeal of the Panama and Amazon cases to the circuit court of appeals, Judge Bryant was reversed by a unanimous court, which held

the regulations under section 9 (c) valid and found it not necessary to pass upon the constitutionality of the production sections of the code in that case. The cases have been appealed to the United States Supreme Court.

Altogether, 22 cases have been instituted to enforce the oil-administration program; 6 of them have dealt with the control of production, 4 also involving the validity of regulations issued under section 9 (c) of the Recovery Act. Three cases involve labor provisions of the code; 14 involve various rules of the marketing section of the code.

BUREAU OF RECLAMATION

(Elwood Mead, Commissioner)

Until settlement reached the borders of the arid region, public land in the humid section was the door of opportunity for the restless and enterprising. But when the wave of settlement reached the arid zone pioneers had to deal with new conditions and were confronted with new problems. Homes and civilization were limited not by land but by water. To make that water available required a new type of engineering knowledge and experience, while to make homes permanent and secure, codes of water laws had to be formulated and put into operation. Irrigable land became therefore the new frontier and is so today.

Private and district enterprises were able to build the simple channels which carry water to the valleys bordering streams, but when it became necessary to divert and control rivers and when storage of floods became a fundamental requirement, some agency with greater resources and with a continuity of policy which would reach beyond the limits of a single State was essential. Out of this need the reclamation fund and the Bureau of Reclamation were established.

Recently the opinion has prevailed in some sections that further construction of irrigation works is uneconomic and injurious. It arose out of an exaggerated conception of the area irrigated under Federal works, which is less than 1 percent of the total farmed area in the United States. Critics of irrigation have not realized how necessary the works being built are to the prosperity of the cities and towns and the industries located in that region. They do not understand the plight of valleys menaced with water shortages. If they did they would join the West in energetically urging the building of storage reservoirs. It required the great drought to show to the Nation the service which the reservoirs already completed is rendering and the need for early completion of those under way.

Already, early in midsummer, range stockmen are buying alfalfa as it is cut on the irrigated fields to save their flocks and herds from starvation. What the country where this is happening would be like if the lands that are now green and productive were not being irrigated can be understood only by those who have seen it.

Although it is only June the bed of the Rio Grande is dry. If the city of El Paso and the irrigated country around had to depend on the unregulated flow of that river this would be a year of calamity to 165,000 people. Fortunately the Elephant Butte Dam and Reservoir

were built by the Reclamation Bureau and the stored water is supplying the needs of those people. It not only enables that project to help feed the people in the surrounding country but saves the city of El Paso from an enforced exodus. Twice in the last 5 years the storage at American Falls on the Snake River has saved crops worth the cost of the reservoir, and this year the stored water will be worth the value of the farms and fields which it supplies with moisture.

The Federal reclamation projects in the valleys of the North Platte, Klamath, Pecos, Cheyenne, Yellowstone, and Big Horn rivers will be called upon to supply the local needs for both human and livestock consumption. They will save towns and counties from depopulation and save livestock, which will be sorely needed next year.

The reservoirs that are furnishing water this year to the Yakima, Okanogan, Orland, and Boise projects have enabled fruits and vegetables to be grown that are being shipped to widely separated areas in the arid region and to the Central States which have no crops this year. The Echo Reservoir in Utah, built against the protests of those who see in irrigation nothing but a contribution to the surplus, is saving the vegetable canning industry of Utah and will do much to feed the surrounding country this winter. The beet sugar industry of the arid region is one of the most valuable features of its agriculture. Millions of dollars are invested in factories. Many thousands of workers are employed. The beets required to supply these factories are being grown by water stored in the reservoirs on the North Platte, the Belle Fourche, Minidoka, Strawberry Valley, Shoshone, and Milk River projects. The Salt River and Newlands projects are the financial mainstays of the States of Arizona and Nevada. Both States need more irrigation to furnish winter feed for range livestock and to meet the local food requirements of their cities and towns. It is no exaggeration to say that no greater contribution could be made to the stability of both States than to complete the reservoirs being constructed on the Colorado, Humboldt, and Truckee Rivers.

The importance of continuing the program of construction now under way is most strikingly shown by the situation on the Colorado River on which Boulder Dam is being built. If it had been completed 2 years ago the irrigated Southwest would not have known there was a drought. Because it is not completed and because water could not be stored this season 70,000 people in the Imperial Valley are faced with appalling disaster. They lack water for irrigation, for watering livestock, and for domestic purposes. It is too early to fix the limit of loss but it will be equivalent to a good part of the cost of the dam. If Boulder Dam were not assured there would be a panic in the Southwest.

The drought is creating a demand for irrigated areas that has been absent for the past 10 years. It gives a new significance and impor-

tance to the irrigated farms now available and to the few localities where additions can be made to the irrigated area.

Furthermore, where farmers are transferred from submarginal dry areas to farms under irrigation, for every acre of irrigated land that they cultivate two or more acres of dry land will go out of production and the net result will be the elimination of areas that are now adding to the troublesome agricultural surplus, especially wheat, and increase in the production of crops needed locally.

The time has come for an appraisal of the relation of irrigated agriculture to the civilization and future well-being of the western third of the country. Each irrigated area brings tangible money benefits to many others besides those who live on the lands irrigated. Cities are created and sustained. Phoenix, Ariz., is as much a creation of irrigation as are the citrus groves and alfalfa fields that surround it. These irrigated oases lessen the risk and increase the income of the stockmen of the range country for miles around. They create taxable valuations and incomes that help support city, county, State, and Federal Governments. Irrigation communities are a market for manufacturers and merchants in remote industrial centers. No true economic balance sheet of any project can be made without including these indirect benefits which should be considered but have been overlooked in the past.

An economic survey of a few typical reclamation projects is recommended. Such a survey should be taken to determine the economic condition of the irrigators who have entered into contracts with the United States to repay construction costs. It should aim to appraise the agricultural opportunities and possibilities of the project and the extent to which they are being utilized. It should collect data as to the extent to which contract payments are being made, and when not being made, the reasons therefor. Consideration should be given as to whether the plan of repayment is fair to the irrigators and also to the agriculture outside of these projects and if there are objections they should be stated and modifications proposed. This survey and appraisal of existing projects will help to inform the whole country regarding the achievements or defeats of our reclamation policy and as to what, if any, modification should be made in the present reclamation law.

It should include a study of the relations of irrigation and power as a part of the reclamation policy. The past 15 years have shown the importance of power development as an adjunct to irrigation enterprises, but to the present time no definite policy has been inaugurated regarding the ownership of these power plants, the plan of operation, and the disposition of their profits. The Bureau believes they should be built and operated as permanent Government works and that the profits after the works have been paid for, should go into the reclama-

tion revolving fund to be used in building additional projects. If this plan is to be followed legislation is needed.

CONSTRUCTION ACTIVITIES DURING FISCAL YEAR

With $103,535,000 allotted by the Public Works Administration for continuation of work on existing projects and starting work on new projects, construction activities took on a new impetus and the Bureau had more to do than at any time in its history. It was necessary to increase the Denver office working force from 250 to 700 to handle this extensive program and make necessary studies and investigations, design the various structures, and prepare plans and specifications for bidding. In addition our engineers did all the design and specification work for the Tennessee Valley Authority in connection with the Norris and Joe Wheeler Dams, and also the Caballo Dam on the Rio Grande for the International Boundary Commission.

On the Vale project in eastern Oregon, with $1,000,000 available, a contract was let in February 1933 to Hinman Brothers, Denver, Colo., for $496,286.10 to build the Agency Valley Dam and Reservoir on North Fork of Malheur River near Beulah. The dam is a moistened and rolled embankment of clay, sand, and gravel, with a maximum height of 90 feet. The reservoir will supply needed additional storage for the project lands.

The first work undertaken on the $22,700,000 Casper-Alcova project, on the North Platte River near Casper, Wyo., was the diversion and outlet tunnel at the site of the Alcova diversion dam. The Lawlor-Woodward Co. of Seattle, Wash., has the contract at a price of $269,905 and on June 30 the work was 60 percent completed. In March of this year contracts were let for building the first 3½ miles of the Casper Canal extending northeasterly from the Alcova Dam site. The contractors and contract prices are as follows: Utah Construction Co., Ogden, Utah, schedule 1, $225,990; J. A. Terteling & Sons, Spokane, Wash., schedule 2, $89,865; Edward Peterson, Omaha, Nebr., schedule 3, $293,465. A service road on the west side of the North Platte River, 3 miles in length, was built from a point on the county road 36 miles northeast of Parco to the Seminoe dam site. Government forces constructed a 66-mile transmission line from Casper to the Alcova and Seminoe Dam sites and two substations.

An allotment of $5,000,000 was made available for continuing construction on the Owyhee project in Oregon-Idaho, and in November 1933, J. A. Terteling & Sons, Spokane, Wash., received a contract for building 30 miles of the North Canal and also the Mitchell Butte lateral, all in the Mitchell Butte division, at a price of $492,075.75. Structures were let under a separate contract to Barnard-Curtiss Co. of Minneapolis, Minn., for $154,290. The Morrison-Knudsen Co., Boise, Idaho, was awarded a contract for $162,518.50 for con-

structing a 10-foot 6-inch diameter plate-steel siphon across Snivly Creek and a 9-foot diameter siphon across the Owyhee River on the North Canal.

The first of the four Salt Lake Basin projects in Utah, financed with P.W.A. funds, to be undertaken was the Hyrum project near Logan. In January 1934 J. A. Terteling & Sons of Spokane, Wash., obtained a contract for building the Hyrum Dam and Reservoir on Little Bear River at a price of $337,211. The reservoir will have a gross capacity of 18,000 acre-feet and net capacity of 14,000 acre-feet above the outlet for project canals. The dam is an earth-fill structure with a maximum height of 90 feet.

The first work on the $63,000,000 Columbia Basin project in Washington, for which $15,000,000 was made available, was excavation of 2,040,000 cubic yards of overburden at the Grand Coulee Dam site. David H. Ryan, of San Diego, Calif., was awarded the contract in December 1933 for $534,500 and completed it in June. The Western Construction Co., of Seattle, Wash., began work in March on concrete piers for the Columbia River bridge, the contract price being $180,-177.40. On May 17 bids were opened for building the United States Construction Railroad from Odair on the Northern Pacific to the dam site, a distance of about 30 miles. Contract was awarded July 18 to David H. Ryan, of San Diego, Calif., with a bid of $235,570. The Crick & Kuney Co., of Spokane, was awarded a contract on June 4 for grading and structures for highway and construction railroad in the coulee at their bid of $220,676.50. Bids were opened on June 18 for construction of the Grand Coulee Dam and power plant. The low bid of $29,339,301.50 was submitted by Silas Mason Co., New York City; Walsh Construction Co., Davenport, Iowa; and Atkinson-Kier Co., San Francisco, Calif., acting jointly. Contract was awarded July 13. Street grading in the Government camp site was started and at the end of the year preparations were being made to advertise for construction of water and sewer systems and residences.

An allotment of $600,000 was made for the Sun River project in Montana to build additional laterals and drains. The first contract was awarded in January 1934 for earthwork and structures for open drains in the Greenfields division to the Morrison-Knudsen Co., of Boise, Idaho, for $72,105. At the end of the year plans and specifications were ready for the Mill Coulee and lateral extensions.

Construction of open drains on the Yuma project in Arizona and laterals on the Milk River project in Montana was continued. On the Elephant Butte division of the Rio Grande project, New Mexico-Texas, construction of drains and laterals was in progress. With an allotment of $100,000 reconstruction of canals and structures was carried on in the Stanfield irrigation district in Oregon. Similar work

was also in progress in the Bitter Root irrigation district near Hamilton, Mont.

During the year just closed the Bureau in its construction activities built 89 miles of canals and drains; 37 tunnels with a total length of 6,926 feet; 1,029 canal structures, 70 bridges, and 265 culverts; and laid 2,723,165 feet, or 516 miles, of pipe. There were excavated 7,958,165 cubic yards of earth and rock, making the total to date 326,962,284 cubic yards. The Bureau used 2,666,972 barrels of cement and placed 2,403,346 cubic yards of concrete.

STATISTICAL DATA

The area irrigated in 1933 with water from Government works was 2,828,787 acres, an increase of 59,182 acres over that for 1932.

The area cropped was 2,797,815 acres, an increase of 22,535 acres.

The total value of crops was $84,191,733, an increase of $34,033,352 compared with 1932, and of $10,231,356 compared with 1931. This increase in crop values was due largely to increased prices received for crops.

During the period 1906, when water was first available, to and including 1933, the cumulative value of crops grown on land irrigated from Government works amounted to $1,970,239,991.

Construction payments in cash and credits from power and other sources received during the fiscal year 1934 were $481,192.26, a decrease of $406,268.42 compared with the previous year.

Payments for operation and maintenance were $1,122,473.99, a decrease of $15,929.20 compared with the previous year.

Total payments amounted to $1,603,666.25 compared with $2,025,863.87 in 1932, a decrease of $422,197.62. Income to the reclamation fund from all sources during the fiscal year was $4,424,-862.69, or $263,392.88 less than for the previous year.

The operation expense for the year was $1,108,950.07, a decrease from the previous year of $18,444.33.

Excess of operation and maintenance receipts over expense for the period amounted to $13,523.92 compared with an excess of receipts over expense of $11,008.79 for the previous year.

Construction work was carried on with funds provided under the National Industrial Recovery Act. A total of $103,535,000 was allotted to the Bureau.

Operation and maintenance of the irrigation, drainage, and power systems was carried with direct appropriations from the reclamation fund, money advanced by the water users, organizations, and revenues from power operations.

The act of March 27, 1934, extended the provisions of previous acts granting temporary relief to water users on irrigation projects, and

construction charges coming due for the year 1934 were not required to be paid. This explains the reason for decreased payments as given under this heading.

ADJUSTMENT CONTRACTS

On June 12, 1934, December 27, 1933, and January 11, 1934, respectively, adjustment contracts under the act of Congress of May 25, 1926 (44 Stat. 636), were made with the Grandview irrigation district, Yakima project; the Langell Valley irrigation district, Klamath project; and the Horsefly irrigation district, Klamath project. During the fiscal year adjustment arrangements under the moratorium acts were made on all of the projects where construction charge installments would otherwise have been collectible.

SETTLEMENT ACTIVITIES

In line with the policy of the Administration to limit the further development of productive areas, only one acreage of consequence was opened to entry during the past fiscal year. On the Kittitas division of the Yakima project, Wash., 25 farm units were thrown open on May 1, 1934, involving a total irrigable area of 1,843 acres. Owing to the prevailing drought conditions the demand for irrigated farms showed a marked increase and 87 formal filings were made for the small number of units included in the Kittitas opening. Of the 78 who appeared before the examining board 62 were residents of the State of Washington, the remaining applicants coming from nearby States. By July 5 all units, with the exception of three on which appeals were pending, had been awarded.

On the projects for the construction of which the Public Works Administration has allotted funds, irrigation development which would bring into cultivation appreciable additional areas is not included in the authorization.

VERDE PROJECT, ARIZONA

An allotment of $4,000,000 was made by the Public Works Administration for this project, of which $500,000 was for making investigations and estimates of cost of a project comprising an area of land of about 85,000 acres, the feasibility of which depends upon the quantity of water that can be depended upon for irrigation. Studies have been under way to determine this important matter as well as investigations to determine feasible dam sites for the storage of water on the Verde River. All of this work was still in progress at the close of the fiscal year and a conclusion had not been reached as to the feasibility of the project.

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ECONOMIC AND ENGINEERING OPERATIONS

SALT RIVER PROJECT, ARIZONA

Agricultural conditions showed some improvement over last year. Crop returns showed a gain of $3,000,000 (approximately 30 percent) over the very low figure of 1931–32, which still left the crop receipts less than half the 1929 figure. The increases were in the major acreage crops, such as alfalfa, cotton, and grain, which were $4,000,000 greater than in 1931–32, but a drop of $1,000,000, mainly in lettuce, reduced the net gain to approximately $3,000,000. It is anticipated there will be a further improvement during 1934. Restricted water supply, unfortunately, will prevent many farmers from taking advantage of the apparently favorable outlook for lettuce and other cash crops, which will be comparatively free from competition of large nearby areas whose crops cannot be depended on because of the drought. The rapidly decreasing water stored in the four project reservoirs, owing to the entire failure of the winter and spring run-off and continued absence of rain, has necessitated drastic restriction in water apportionment and maximum operation of all pumps for utilizing underground water. Unless increased by summer rains, the stored water at the end of the irrigation year, September 30, 1934, will be reduced to around 100,000 acre-feet. The year 1933–34 is among the driest of record in 46 years. In addition to the restricted irrigation supply the low head in the reservoirs on June 30 was at a point where the project hydroelectric plants were barely able to handle peak loads. This condition exists in spite of the reduction in power load caused by the almost complete cessation of mining operations which consumed a large part of the system output of electric energy.

YUMA PROJECT, ARIZONA-CALIFORNIA

Economic conditions on the project improved during the year, to which the several relief acts passed by Congress, extending construction repayments, and a rigid curtailment of operation and maintenance expenses were the principal contributing factors. The Yuma County Water Users' Association has paid in full all operation and maintenance charges due the Government during 1934 and advanced a substantial payment on the charges due in 1935. The project has only one bank, making few, if any, farm loans, so that water users must rely mainly on Government loan agencies for financial assistance. The Cotton Finance Corporation has made loans for financing both the 1933 and 1934 cotton crops. Other cotton growers were aided through the Crop Production Credit Corporation. The Farm Bureau Marketing Association, a cooperative handling mainly alfalfa hay

and seed, completed a successful year by retiring all indebtedness with bank credit established for financing 1934 operations.

Yuma Mesa.—There was no new development on the Mesa unit, and although prices for citrus products were the same, returns were less during 1933 than for the preceding year because of materially reduced yields. Prevailing prices were $0.01 and $0.0125 per pound. The Yuma Mesa Citrus Growers' Association marketed the crops.

The only construction work in progress was confined to extensions to the drainage system and the rebuilding of about 1,100 feet of levee which was lost in the 1921 flood.

BOULDER CANYON PROJECT, ARIZONA-NEVADA

Construction in Black Canyon was in progress on practically all the major features of Boulder Dam, power plant, and appurtenant works. The contractor, Six Companies, Inc., continued to prosecute the work in an efficient and rapid manner. The peak of employment occurred on June 30, when 5,218 employees were listed on the pay rolls of the Bureau of Reclamation and project contractors. The average number of men employed in construction was highest in May, when 4,648 were working for the Government and contractors, and the gross pay roll was $743,581.77. The Public Works Administration made an allotment of $38,000,000 for continuing construction on this project.

Excavations in the river channel for the dam foundation were completed and the first concrete placed in the dam on June 6, 1933. Seven months after starting, a million yards had been placed; three and a half months later half of the concrete for the structure had been poured; and at the end of the fiscal year the volume of concrete in the dam amounted to 2,135,030 cubic yards, raising the structure to a height of 435 feet above bedrock. The record concrete pour for 1 day occurred on March 20, when 8,904 cubic yards were deposited in the dam, and another 1,558 cubic yards placed in other structures. Cooling was started on August 8 and was completed to elevation 745 on June 30, 1934. Grouting of contraction joints was commenced on May 24 and finished to elevation 625. The slot was poured to elevation 745.

The channels, weirs, and piers of the spillways were practically completed, and lining of the inclined tunnels was in progress at the end of the year. The four drum gates were installed for the Arizona spillways and their erection was progressing for the Nevada structure.

Concrete was poured in all intake towers, the four lower gates were installed, and erection was started in May for the upper gates in the Nevada downstream tower. At the end of the fiscal year the lowest tower was 130 feet above its base and the highest, 172 feet.

Excavations were practically completed for all of the 92 tunnels and 13 shafts that were driven for project construction. The two 37-foot diameter penstock-header tunnels and the 18-foot inclined penstocks were lined with concrete, and lining was nearly finished for the horizontal penstocks.

The canyon wall valvehouses, construction adits, and connecting roads were excavated. The outlet pipes of 8½-feet diameter were installed in the Arizona tunnels and were placed in position ready for erection in the Nevada tunnels. The first concrete was poured for the powerhouse wings in January, and at the end of the fiscal year concreting was in progress for the entire lengths of both wings. Six Companies, Inc., has made arrangements to haul the plate steel pipe from the fabrication plant of the Babcock & Wilcox Co. to the 150-ton Government cableway.

The Babcock & Wilcox Co. gradually increased production of fabricated pipe until in June, 1,582 tons of pipe were completed or at an average rate of 52.7 tons per day.

The penstock header and penstock tunnels were rapidly being made ready for pipe installation, and the first of the 30-foot sections are expected to be shipped to the tunnels in July 1934.

A great amount of interest was displayed in construction activities, the visitors checked at the reservation gate numbering 191,788 for the year. A monthly peak of 30,371 occurred in March and a week-end peak of 5,461 on March 24–25. The Boulder Dam Hotel was completed in Boulder City in December, and several hotels were available in Las Vegas, but on many week-ends the two towns were hard pressed to accommodate their guests.

The bureau of power and light of the city of Los Angeles commenced construction of the world's largest transmission line, to carry Boulder Dam power to Los Angeles, at line voltage of 275,000. Items of interest are its length of 270 miles, the steel towers 109 and 144 feet in height, and the 1,626 miles of hollow core copper tube, 1.4 inches in outside diameter.

ALL-AMERICAN CANAL, ARIZONA-CALIFORNIA

The construction of the All-American Canal was authorized by the Boulder Canyon Project Act of December 21, 1928. An allotment of $6,000,000 for this project was made by the Public Works Administration in November 1933, but because of legal requirements connected with the execution of a repayment contract, the funds were not available until March 20, 1934. Work was promptly started and drawings and specifications prepared and bids received June 7. Contract for earthwork covering schedules 1 to 6, inclusive, was awarded to W. E. Callahan Construction Co., St. Louis, Mo., and Gunther & Shirley, Dallas, Tex., the amount of their bid being $4,859,587.

Property of Reagan Conservation

Schedule 7 covering rock excavation was awarded to Griffith & Co., Los Angeles, at a bid of $226,800. These contracts cover 30.6 miles of earthwork on the All-American Canal from a point opposite Laguna Dam through the sand hills area to the site of the proposed bifurcation works for the Coachella Canal. The capacity of this portion of the canal varies from 15,155 to 10,155 cubic feet per second.

The contract dated December 1, 1932 with the Imperial Irrigation District for construction of the All-American Canal was contested by the Coachella County Water District which desired a separate contract with the United States instead of having to become part of the Imperial Irrigation District. The Imperial District contract was validated by the court on July 3, 1933. An appeal was carried to the Supreme Court, but was dismissed in February 1934, by the Coachella Valley County Water District after this district had settled its controversy with the Imperial Irrigation District. A contract for construction of capacity for its use in the All-American Canal was negotiated with the Coachella District and submitted to the Department for approval. A contract was also negotiated and approved as to form by the Department on May 16, 1934 with the city of San Diego for provision of capacity in the All-American Canal for use by the city.

ORLAND PROJECT, CALIFORNIA

A slight improvement was noticeable in the economic condition of the project owing to the general advance over prices received for farm products the preceding year. Crop yields, with the exception of oranges, were uniformly satisfactory. Because of the unprecedented cold temperatures of December 1932, there was practically no production of citrus fruits in 1933. At the end of the fiscal year, however, the prospects for a good crop had materially brightened. Actual collections of reclamation charges were, on account of the deferment of the payment of construction charges under the act of April 1, 1932, rather light, aggregating $32,330.77 as against $53,359.46 during the fiscal year 1933. Loans obtained from the Federal Farm Loan Bank of Berkeley, Calif., were of a very decided assistance to the water users in enabling them to pay their operation and maintenance charges. The crop value of $29.33 an acre for 1933, showed an increase of $5.50 over that of the preceding year. Reduction in available funds prevented the carrying forward of the concrete lining program on laterals subject to excessive loss of water and high maintenance cost.

GRAND VALLEY PROJECT, COLORADO

During the 1933 season 470 farms were irrigated with an average crop value per acre of $21.75 as compared with $16.26 for the previous season. Charges for water were reduced, by means of drastic econo-

GENERAL LAND OFFICE
Reference Room

mies and of lower material and labor costs, from $3.50 for 4 acre-feet in 1932 to $1.30. The beet sugar factory at Grand Junction, which had been idle for several years, operated during the season of 1933–34. The Colorado Potato & Bean Growers Associations operated successfully during the year and handled a large part of these crops for project farmers. Crop financing was largely taken care of by Federal agencies and numerous land loans were made in the vicinity of the project by the Federal Land Bank. Exclusive of a slight amount of work to complete the Grand Valley power plant no construction work was done on the project during the fiscal year. In June 1934, preparations were being made to undertake a limited amount of work on drainage extensions from operation and maintenance funds.

UNCOMPAHGRE PROJECT, COLORADO

During the 1933 irrigation season 1,589 farms were irrigated, 776 being farmed by owners and 813 by tenants. The average crop value of $22.03 per acre was approximately double that of 1932. The beet sugar factory at Delta, Colo., handled all beets raised on the project. The Colorado Potato Growers Association, the principal marketing organization, handled potatoes and onions chiefly. A number of poultry and hog associations, as well as cooperative oil and service stations, continued to do business as successfully as could be expected under existing economic conditions. The Uncompahgre Valley Water Users' Association assumed control of the operation and maintenance of the project on January 1, 1932. No construction work was in progress. Recent legislation granting a moratorium for the construction charges has postponed the starting of the drainage program. The Public Works Administration allotted to the project $2,725,000, of which $2,400,000 was allocated to the building of the Taylor Park Dam and additional concrete lining in the Gunnison Tunnel and $325,000 to the rehabilitation of existing structures on the project. Taylor Park Reservoir will provide a necessary supplemental water supply for the project.

BOISE PROJECT, IDAHO

Low prices for farm products prevailed in 1933. The prospects for 1934 have improved, but with some reduction in yields because of a short water supply. Cooperative buying and selling organizations are active and still growing in the dairy, poultry, and fruit business and numerous other lines. No construction is in progress, although a small amount of drainage in the Black Canyon and Boise-Kuna districts is contemplated. An early beginning on repairs to the Arrowrock Dam is also planned. Operation and maintenance of the reserved works (2 storage dams, 2 diversion dams, 2 power plants, and 1 pumping plant) is being continued by Government forces, while the

maintenance of the canal system and distribution of water have been turned over to the water users. Needs for the future consist mainly of a supplemental supply of water for the Arrowrock division, the year of 1934 being a season of 60 percent supply. Public interest centers around the scheme to divert water to the Boise River from the Salmon River watershed.

KING HILL PROJECT, IDAHO

The operation of the King Hill project has been continued by officials of the King Hill Irrigation District. The cropped area for the season of 1933 was approximately 7,300 acres, with an average value per acre of $16.85, an increase of more than $6 from the season of 1932. The project is making a slow recovery from the financial depression with prospects for increased revenues for 1934, resulting from better prices for farm products.

MINIDOKA PROJECT, IDAHO

There were 1,528 farms irrigated on the gravity division last year, and 862 on the south side pumping division. The total crop value the past year averaged $29.40 compared with $14.50 in 1932. As a result there has been a general improvement in financial conditions on the project. The snowfall on the Snake River drainage area during the winter of 1933–34 was extremely light, so that both Jackson Lake and American Falls Reservoirs failed to fill this year. By the end of June, about 70 percent of the project's total stored supply had been exhausted. At Jackson Lake clearing of timber around the reservoir was prosecuted by several Civilian Conservation Corps camps. The enlargement program of the south side pumping division was continued throughout the year and additional pumps were installed. About 3 miles of drains also were built on the pumping division.

On the Gooding division, some 89 small lateral structures were built by contract, and 3 main canal checks and 1 flume across the canal were constructed by Government forces. Future needs of the project include provision for an additional water supply. It appears advisable to complete the enlargement of canals and to increase pumping capacity on the south side pumping division. A form of contract between the United States and the Idaho Power Co., providing a means of conserving winter water for storage at American Falls Reservoir, was under consideration.

BITTER ROOT PROJECT, MONTANA

The United States in 1930 assisted this project in refinancing its bonded and warrant indebtedness and in making some necessary improvements on the canal system. The work was continued during

the past fiscal year under the supervision of the Bureau of Reclamation and $90,000 was advanced to the project for this purpose. There is a balance of $30,000 to be advanced early in the next fiscal year, which will complete the total of $250,000 authorized by Congress for the rehabilitation of the project. The area under cultivation remains approximately 15,000 acres, with an average crop value of $15.70 for the season of 1933 and prospects for a greater improvement in 1934.

HUNTLEY PROJECT, MONTANA

During the 1933 irrigation season 651 farms were irrigated, 310 operated by owners and 341 by tenants. The average crop value per acre was $30.14. Sugar beets remained the principal cash crop with an average yield of 14.86 tons per acre. Practically all the lambs and wool grown on the project are marketed through the Wool Growers Association. During the early part of 1933 improvements were made in the pumping plant from the main to the highline canal which resulted in an increased discharge of about 6 cubic feet per second. The construction of a reservoir at Anita would materially reduce the cost of water delivery to the Fly Creek division as well as improve the service. A low rock and brush dam in the Yellowstone River below the main canal headgates has been necessary for several years in order to operate the canal at full capacity during July and August. Design of a permanent reinforced concrete structure to replace the present temporary structure has been made and construction work will be started in the near future.

MILK RIVER PROJECT, MONTANA

The season of 1933 was unusually hot and dry, but crop yields were much above the average and the upward trend of prices increased the average value of crops from $12.80 in 1932 to $19.60. Sugar beet acreage had increased to more than 10,000 acres which, for the first time in the history of the Chinook factory, provided for a full capacity campaign. Some additional property sales were completed as a result of which dry land farmers took land under the canals. Plans were formulated for the establishment of a subsistence homestead colony on the Malta division to comprise an area of about 2,500 acres of land. There was an improvement in the payment of operation charges during the year and sufficient funds were available for the continued operation of all canal systems, with some curtailment necessary on the Glasgow division in order to balance costs and funds available. An allotment of $65,000 was made for continuing construction work on the project, comprising principally the replacement of wood structures and improvements on the St. Mary Canal. An allotment of $2,000,000 was made for the construction of a storage

dam and reservoir on Milk River. Investigations have been made and a feasible dam site selected. At the close of the year a repayment contract was being negotiated.

SUN RIVER PROJECT, MONTANA

Conditions on the project have continued to improve with a further reduction in the wheat acreage and an increase in crops better adapted to irrigated farming, particularly an area of about 4,000 acres of seed peas. Interest in sugar-beet culture with prospects of a gradual increase in acreage is being shown. Many inquiries have been received asking for information about farms that may be available for entry or for sale from farmers living on adjacent dry-land areas. Opportunities will be very limited until lateral extension work now under way has been completed. An allotment of $600,000 was made in 1933 which is being used for further extensions to the drainage system and the extension of the lateral system to bring under irrigation lands located in the easterly end of the Greenfields division and the Mill Coulee division. Contract for the construction of drains was awarded to Morrison-Knudsen Co., of Boise, Idaho, and for canals and structures to Lease & Leigland, of Great Falls, Mont. The canal systems have been operated by the officials on the Fort Shaw and Greenfields irrigation districts.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

Conditions on the project continued to improve during 1933, with an average crop production of $30.40 per acre, which was $9 more than in 1932. The irrigated area of 33,900 acres had also increased about 8 percent. Notwithstanding improved conditions the farmers have found it difficult to meet their financial obligations and every effort is being made to reduce operation and maintenance costs. The canal system is under the supervision of the joint board representing the irrigation districts in the two States. The existing moratorium has relieved the farmers from the payment of construction charges. Owing to depressed agricultural conditions very little settlement work has been carried on. The irrigation districts have succeeded in getting buyers for all of the farms taken over for nonpayment of taxes which have been sold on contract for deed with small down payments. Drought conditions have caused a demand for farms to rent, greatly in excess of the supply of those having suitable buildings.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The run-off of the North Platte River at Pathfinder for 1933 was below normal and, although the irrigation supply was ample, the balance remaining in storage was only 105,000 acre-feet. The present water-year has been the driest of record in nearly 40 years, the run-off

being less than 30 percent of normal, which is 1,400,000 acre-feet. About one-half of the available supply had been used previous to June 30, 1934, and while crops were generally in satisfactory condition on that date rain will be necessary during the balance of the season to insure beet and late potato yields and to prevent extensive damage to alfalfa fields. The economic condition of the project has shown substantial improvement during recent months. Irrigation district organizations have made drastic reductions in wages and other expenditures. The area reported cropped in 1933 was 182,500 acres with an average value per acre of $26.08. Winter feeding of cattle was on a normal scale for 1933–34 but spring sales were unprofitable. About 130,000 head of sheep were fed and showed a reasonable profit. Cooperative marketing of turkeys was continued on an increasing scale and a cooperative dairy products association continued in operation. Construction during the fiscal year 1934 comprised completion of a new transmission line on the north side of the river between the Lingle plant to the city of Mitchell via the towns of Torrington and Morrill. The reserved works of the project, comprising Pathfinder and Guernsey Reservoirs, Whalen Diversion Dam, and the power system, were operated and maintained by the Bureau. The project canal, lateral, and drainage systems were operated and maintained by the project irrigation districts. Wholesale rates for electrical energy have been reduced approximately 15 percent, the base rate being $1.50 per kilowatt per month, demand charge and an energy charge ranging from $0.015 to $0.0055 per kilowatt-hour, based on quantity used.

HUMBOLDT PROJECT, NEVADA

An allotment of $2,000,000 was made by the Public Works Administration for the construction of a storage reservoir on the Lower Humboldt River to provide a supplemental water supply for the irrigable lands in the vicinity of Lovelock. Surveys and investigations were promptly started, as well as negotiations with the landowners on the required repayment contract. At the close of the year the contract had been prepared and approved by the electors of the district, plans and specifications covering the construction of the Rye Patch Dam were completed, and the work was ready to be advertised as soon as all legal matters had been adjusted.

NEWLANDS PROJECT, NEVADA

The project experienced a serious water shortage in 1933 with even more serious conditions prevailing in 1934. It was necessary to resort to pumping from Lahontan Reservoir and drainage ditches in order to supply some of the water required for irrigation. Four thousand acre-feet of water in Donner Lake were purchased at a price

of $2.50 per acre-foot. Negotiations were finally completed in 1934 for pumping 36,000 acre-feet of water from Lake Tahoe, which will be divided between the irrigation interests on the Truckee Meadows and the Newlands project. There was a slight increase in crop values but owing to continued low prices of farm products, the value of crops for 1933 reached only $12.23. Federal assistance has been extended to the project by the Civil Works Administration and also the Federal Emergency Relief Administration. Every effort has been made to reduce operation and maintenance expenses and the charges have been fixed by the district at $1 per acre with the privilege of paying in three installments. The Truckee-Carson irrigation district has continued the operation of the project. No construction work is in progress but an application has been filed with the Public Works Administration for an allotment of $500,000 to cover numerous project betterments, enlargement of the Truckee Canal, and increased capacity of Lahontan Reservoir.

TRUCKEE STORAGE PROJECT, NEVADA

This project was granted $1,500,000 for the construction of a storage reservoir on the headwaters of the Truckee River for the purpose of supplementing the water supply of the Truckee Meadows adjacent to the city of Reno. Preliminary investigations have heretofore been conducted and a feasible dam and reservoir site located on the Little Truckee River. In view of the complicated water situation existing on this river system and the necessity of reaching an agreement as to the extent and priority of existing rights, considerable time has been required to reach a satisfactory adjustment of these matters. At the close of the fiscal year good progress had been made and a repayment contract drafted and submitted to the Washoe County water conservation district, which will assume the obligation of repaying the cost of this storage reservoir.

CARLSBAD PROJECT, NEW MEXICO

There were 438 farms cultivated during the year by owners and managers and 159 by tenants. The total acreage irrigated was 24,624 acres. Crop yields for 1933 averaged $47.49 per acre or an increase over 1932 of $27.90 per acre, which was due to increased yields and better prices for products. Financial conditions were much improved. The land bank deposits were $540,000 on June 30, 1934. Prices of farm lands range from $100 to $250 per acre. The Federal land bank loaned about $650,000 on this project.

Loans for crop production were confined to Federal agencies. Industrial development, which was confined to the potash and oil industries east of Carlsbad, has been substantial. The water supply

for the project was adequate except for alfalfa during the latter part of the fiscal year. Drought conditions prevailed in the Carlsbad area in the spring and early summer of 1934. Storage water was entirely gone at the close of the fiscal year, with the normal run-off lower than at any time in the history of the project. No construction work was in progress but the irrigation district has submitted an application for funds to construct the Alamogordo Reservoir.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

There was a marked improvement in conditions on the project with an increase in the number of farms and the area under irrigation. The average crop value was $45 per acre, an increase of approximately $19 over the average value for 1932. Cotton still remains the important cash crop on the project. The Cotton Growers Association, a strong organization with a large membership, provides crop financing through intermediate credit banks as well as cooperative marketing. The city of El Paso forms an important market for the sale of dairy products, livestock, vegetables, and truck, most of which are marketed through cooperative agencies. Construction work during the fiscal year has been limited to extensions to the drainage system in the Elephant Butte district. Further extensions will be required to relieve scattered areas of water-logged land throughout the project. An allotment of $500,000 has been made for continuing construction of subsurface drains and extensions to the lateral system.

BAKER PROJECT, OREGON

The financial interest of the United States in the Baker project is limited to the construction of a storage reservoir on the Powder River at a cost of $276,588, for which the irrigation district has contracted to make repayments under the provisions of the Reclamation Act. The work was completed in June 1932. The storage reservoir and canal system is operated by the irrigation district. The area under cultivation for 1933 was approximately 6,300 acres, with an average crop value of $11.34 per acre.

STANFIELD PROJECT, OREGON

The project is located in Umatilla County, eastern Oregon. It was originally constructed in 1905 by the Furnish Ditch Co. for the irrigation of approximately 10,000 acres in the vicinity of Stanfield, Oreg. The main canal diverts water from the Umatilla River. The water supply in part is obtained from the McKay Reservoir under contract for 15,000 acre-feet with the Bureau of Reclamation. An allotment of $100,000 has been made by the Public Works Administration for refinancing and rehabilitating this project, and a repay-

ment contract with the Stanfield irrigation district was executed February 12, 1934. A contract for the construction of three siphons and a tunnel on the Furnish Canal and a drain with structures was awarded to J. A. Terteling & Son of Spokane, Wash., in April 1934 at the bid price of $49,593 under Specifications No. 568. Work is in progress on the Shaw and Hard siphons and tunnel. The drainage ditch has been completed and the entire contract was 20 percent completed on June 30.

UMATILLA PROJECT, OREGON

The operation of the east and west divisions of the Umatilla project has been continued under the respective irrigation district organizations, the combined irrigated area of the two projects being approximately 11,000 acres which in 1933 produced crops with an average value of approximately $16 per acre. The farmers have experienced some difficulty owing to low prices of farm products and also to the fact that large areas of alfalfa were winter-killed, and as a result many of the farmers on the project have been on relief rolls. The prospects for the season of 1934 are very much brighter as a result of the increase in the value of crops.

VALE PROJECT, OREGON

The canal system on this project has been completed to deliver water to about one-half of the 30,000 acres of irrigable land. Good progress has been made in the settlement of this area and there are now more than 160 settlers engaged in clearing the land and planting crops. Yields have been good but prices received for commodities have been low. Alfalfa is the principal crop on the project and is either sold in the stack or fed on the farm. With few exceptions farms are operated by the owners.

An allotment of $1,000,000 was made to the Vale project for constructing the Agency Valley Reservoir, for which contract was awarded in January to the Hinman Bros. Construction Co. of Denver, Colo. A second contract was awarded for the construction of about 4½ miles of highway to replace the present road which will be submerged. The allotment was of sufficient size to permit an extension of the main canal, estimated to cost about $150,000. Specifications for this work have been prepared and invitation for bids is to be issued early in the ensuing fiscal year.

KLAMATH PROJECT, OREGON-CALIFORNIA

The main division of the project contains 525 farms, of which 483 were farmed during the calendar year 1933. The average value of crops was $32.25 per acre, which is an increase of 100 percent over the previous year. On the Tule Lake division there were 334 farms, of

which 290 were operated by owners and 44 by tenants. Crop values on this division were $30 per acre. This division has been opened to entry during the past few years, and the new settlers have had considerable difficulty in getting started on their farms because of the unusually low prices received for farm products. The Langell Valley, Horsefly, and Shasta View districts have had but little success in carrying on settlement activities. A supplemental contract has been signed by the Horsefly district which reduces its indebtedness to the United States by about $30,000. The Langell Valley irrigation district has been trying for some time to obtain legislation authorizing the reclassification of the irrigable area and a reduction of its obligation to the United States. They have already obtained a revision of their repayment contract which provides a more favorable schedule of payments. Most of the farm products are sold through cooperative associations and with the prospect of increased prices in 1934 there is a more optimistic feeling on the project. Construction work was limited to some minor extensions of the drainage system on the Tule Lake division and the Klamath irrigation district.

OWYHEE PROJECT, OREGON-IDAHO

In August 1933 the Public Works Administration made an allotment of $5,000,000 for continuing construction work on the Owyhee project and at the close of the year the work was 68 percent completed. During the fiscal year 1934 contracts were awarded which will complete the North Canal from the outlet of tunnel no. 1 to the inlet of the Malheur River siphon, a distance of 39 miles, and the Mitchell Butte lateral, 11½ miles in length. Satisfactory progress was made on all of the construction contracts. It is now expected that delivery of water to a portion of the new project lands can be made in the spring of 1935.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Production and general morale on the project continued to improve during the fiscal year, largely as a result of a prompt recovery of the sheep industry, with increased prices for fat lambs and wool. The 1933 crops reached a value of $15.27 per acre, or an increase of about 20 percent over the previous year. The yields from sugar beets were disappointing owing principally to unfavorable spring weather and thin stands, making the average production on the project just under 9 tons per acre. The commissioners of the Federal Land Bank of Omaha commenced approval of loans on the project in 1933 and more than $100,000 had been advanced at the close of the fiscal year. During 1933 there was not much change in settlement conditions, but the drought of 1934 has brought about a marked increase in the movement of settlers from marginal lands through the assistance of

the South Dakota Rural Rehabilitation Corporation. No construction work was in progress during the fiscal year.

HYRUM PROJECT, UTAH

This project will furnish a supplemental water supply to about 12,000 acres of land along the Little Bear River in the vicinity of Hyrum, Wellsville, and Mendon, which area now has an inadequate water supply. The land is all in private ownership and with a few exceptions the holdings are small. The principal industries include dairying and the production of sugar beets and vegetables. The community is well organized for the sale of farm products and their utilization through canneries, creameries, and beet-sugar factories. The Public Works Administration made an allotment of $930,000 for the construction of Hyrum Dam and Reservoir and about 20 miles of canals. Contract for the construction of the dam was awarded to J. A. Terteling & Son of Spokane, Wash., and work has been in progress since the latter part of March. The location of canals and laterals has been completed and drawings and specifications covering this work are being prepared so that bids can be called for early in the fiscal year 1935.

MOON LAKE PROJECT, UTAH

The sum of $1,500,000 was allotted to this project by the Public Works Administration in November 1933. The work contemplated involves the construction of an earth-fill dam at Moon Lake on one of the tributaries of the Colorado River. This dam will raise the water level of the lake about 56 feet and create a reservoir with a capacity of 30,000 acre-feet. A feeder canal about 6 miles long to the Uintah River is also contemplated. The lands to be benefited comprise 26,000 acres under existing canals diverting from Lake Fork and 14,000 acres under canals on the Uintah River. A draft of repayment contract has been prepared and is now under consideration.

OGDEN RIVER PROJECT, UTAH

An allotment of $3,000,000 for the Ogden River project was granted by the Public Works Administration for the construction of Pine View Dam and Reservoir, a 75-inch wood-stave pipe from the dam to the mouth of Ogden Canyon, about 25 miles of canal extending north to Brigham City, and south for about 8 miles from the mouth of the canyon, which systems will distribute the stored water to lands that have heretofore had only a partial supply of water. Detailed engineering investigations were promptly started, and at the close of the fiscal year plans and specifications covering the construction of

Pine View Dam and appurtenant works had been completed and advertisement issued calling for bids to be opened September 5.

PROVO RIVER PROJECT, UTAH

This project has been given an allotment of $2,700,000 for the construction of a storage dam and reservoir on the Provo River about 12 miles southwest of Heber. An earth-fill dam will raise the water surface about 175 feet giving a reservoir capacity of 145,000 acre-feet, which water will serve as a supplemental supply for the irrigation of 36,000 acres in Salt Lake Valley. An additional supply of water to fill this reservoir will be obtained by diverting a portion of the Weber River through the Weber-Provo Canal which is to be enlarged. The project also comprises the construction of levees across Goshen and Provo Bays in Utah Lake which will reduce the surface area and thereby effect a saving in evaporation losses on the lake. At the close of the fiscal year no construction work had been started but repayment contracts were being negotiated.

SANPETE PROJECT, UTAH

An allotment of $300,000 was made for this project in November 1933. The work planned covers the construction of 2 tunnels, 1 on the Ephraim division about 7,200 feet long with a capacity of 100 cubic feet per second, with short feeder canals, and a second on the Spring City division. The two divisions have an area of 8,000 acres of land now under irrigation but with an inadequate supply of water. Repayment contracts were being negotiated and construction will begin early in the following fiscal year.

STRAWBERRY VALLEY PROJECT, UTAH

Economic conditions on the project are shaped by the 1934 general drought situation. There was sufficient water in storage at the beginning of the year to deliver 20 percent of the contract rights. With funds advanced by the Federal Emergency Relief Administration work was started on the excavation of the new outlet channel which will make it possible to recover an additional 18,000 acre-feet of storage in Strawberry Reservoir which added 10 percent to the contract rights. Investigations were also under way to determine the feasibility of diverting some small streams of water into the Strawberry Reservoir as the limited quantity available for 1934 makes it absolutely necessary to resort to every means possible to increase the quantity that can be used to save valuable crops.

Crop values for 1933 showed an average of $19.18 per acre, which was an increase of only $2 over the previous year. The project is

feeling the benefits of the various Federal relief programs aimed at the general improvement of social and business conditions on the project.

WEBER RIVER PROJECT, UTAH

Echo Reservoir, on the Weber River, with a capacity of 74,000 acre-feet, was constructed in 1930. A small quantity of water was stored in 1931, while in 1932 the reservoir was filled to nearly its capacity. This stored water furnished the necessary supplemental supply of water for the irrigation of 60,000 acres of land in the lower Weber and Ogden Valleys. The average value of crops for 1933 was approximately $40 per acre. The dam and reservoir are operated by the Weber River Water Users Association. In 1934, with its low run-off on all streams in the Salt Lake Basin, Echo Reservoir filled to nearly half capacity. This quantity of water will be used with a maximum of efficiency to irrigate the valuable crops of fruits and vegetables that are produced on the lands of this project.

COLUMBIA BASIN PROJECT, WASHINGTON

The Public Works Administration has made an allotment of $15,000,000 to carry on the construction of the Columbia Basin project, which comprises the Grand Coulee Dam and power plant located on the Columbia River about 75 miles west of Spokane, Wash. The estimated cost of the initial development is: Dam, $42,000,000; power plant, $21,000,000. The first development includes the construction of a concrete straight gravity dam about 300 feet in height with a crest length of 3,400 feet. The initial power development provides for the installation of three hydroelectric generators with a capacity of 35,000 kilovolt-amperes under the low dam. This initial development is for power purposes only. Eventually the dam is to be increased 200 feet in height, which will permit the construction of the Columbia Basin irrigation project, and with the increased height of dam the capacity of the generators will be increased to 105,000 kilovolt-amperes each.

An effort was made to get construction work under way at the earliest possible date and in December 1933 contract was awarded for the removal of the earth overburden at the two ends of the dam. Contract for construction of the dam was awarded to a combination of firms consisting of the Silas Mason Co., Walsh Construction Co., and Atkinson-Kier Co., these contractors having submitted a low bid of $29,339,301. Other contracts have been awarded covering construction of railroad, highways, streets, and water and sewer systems for the construction camp, making a total of $30,500,000.

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OKANOGAN PROJECT, WASHINGTON

The project had the largest supply of gravity water during 1933 that it has had since 1921. Indications are that the gravity supply of water for 1934 will not, however, be in excess of 2 feet per acre. There was a slight increase in irrigated acreage during 1933. The project apple crop for the 1934 season will run from average to excellent with the assumption that returns will be far better than for the past year. Cherries for 1934 brought the growers a fairly good return. Pear harvest will start about the first week in August. With the exception of pears and cherries very little soft fruit is marketed. A total of $3,859.95 was spent during the fiscal year in lining 2,040 linear feet of the Upper Main lateral. Approximately 9,100 linear feet of 4- to 12-inch pipe was installed in replacement of worn-out lines. Some half dozen old wooden weirs were replaced with concrete during the spring of 1934.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton divisions.—There was but little change in the irrigated area of these two divisions, but increased prices of farm products showed a gratifying increase over the low year of 1932, the average per-acre value for the Sunnyside division being $39.15, and for the Tieton division, consisting principally of fruits, $87.10. The water supply was ample for all requirements, and a very heavy flood which occurred in December 1933 insured a full supply of water for the season of 1934. The operation and maintenance of these two divisions of the project has continued under the Bureau of Reclamation. No construction work was in progress during the year.

Kittitas division.—Excellent progress was made during the year in the development of lands on this division. The area irrigated in 1933 was 44,578 acres. The principal crops are alfalfa hay, small grains, potatoes, and seed peas. The average per-acre value of crops produced was $18.85. On February 16, 1933, 47 farm units were opened to entry and 25 more were opened under date of April 12, 1934. The number of applications received was in excess of the farms available, and entries were allowed on all of the lands with the exception of a very few small tracts that were not particularly desirable. The operation of the division was taken over by the Kittitas reclamation district at the beginning of the calendar year 1934. Construction work was limited to placing concrete lining in about 1,200 feet of the South Branch Canal and an extension of the Badger Creek wasteway.

Kennewick division.—Settlement on this division is progressing slowly. The area served by the pumping plant during 1934 included about 3,000 acres out of a total of about 4,000. An adjustment contract covering reduction of power rates for a period of 3 years has

been concluded, and these reduced rates have been extended to the Franklin County and Richland irrigation districts that also use power from the Prosser power plant. Construction work was limited to some miscellaneous improvements at the intake of the Prosser power plant.

Storage division.—The construction of Cle Elum Dam was completed September 5, 1933, at a cost of $2,383,491. There remains to be built the parapet wall on top of the dam which will be delayed a year or more to await any possible settlement of the earthen embankment. Spillway gates will be installed when the need develops for full capacity of the reservoir. The estimated cost of these additional features is $80,000.

CASPER-ALCOVA PROJECT, WYOMING

Construction of this project was approved in October 1933, and an allotment of $12,000,000 made by the Public Works Administration. At the close of the fiscal year 3 of the 4½ miles of West Side Service Road to the Seminoe Dam site were completed. Approximately 50 acres of the Seminoe Reservoir area were cleared. All excavation on the Alcova diversion tunnel and outlet tower had been completed, and 1,467 cubic yards of concrete lining placed in the diversion tunnel. One hundred and seventy-five linear feet of canal tunnel excavation had been completed and 63,780 cubic yards of open canal excavated. The transmission line from Casper to the Seminoe Dam was approximately 50 percent complete, 32 miles of the line having been constructed to the Alcova Dam, and about 34½ miles of telephone line were constructed from the Pathfinder Dam, via Alcova, to a point approximately 4½ miles below the Seminoe Dam site. Future plans provide for the construction of the Seminoe storage dam and power system, the Alcova diversion dam, the lateral system and appurtenant structures, and the continuation of construction of the Casper Canal and appurtenant structures and the transmission line. Appppropriations are available for continuation of this work.

RIVERTON PROJECT, WYOMING

In the fall of 1933 there were 73 settlers on the project and the area in cultivation had increased 60 percent over the previous year. Crops in 1934 are in excellent condition when it is considered that 40 percent of the land is in cultivation for the first time. Cash is still scarce but the settlers owe little and the general outlook is brighter. All water users have paid the advance water rental charge for the current season. A secondary highway was built into the project during the year and construction was begun on another. There is still room for additional settlers but they are now coming about as fast as they can be assimilated. No construction work was in progress during the fiscal year.

SHOSHONE PROJECT, WYOMING

The water supply on this project has been more than sufficient to meet all requirements and some water was sold to relieve an acute shortage on private irrigation projects in Montana. The average value of crops, $16 per acre, has increased, but is still considerably below the 10-year average. Settlement activity on the Willwood division showed a decided increase over the previous years and the drought conditions that existed in 1934 have brought in a large number of settlers to look over the vacant farms on the Willwood division. The Associated Seed Growers have continued to operate a seed warehouse at Powell, which has given employment at cleaning seed peas and beans to about 25 during the winter months. A large portion of the crops and livestock products are sold through cooperative marketing associations. Construction work was limited to short extensions to the drainage system on the Willwood division and highway repairs to the power plant at Shoshone Dam.

SECONDARY INVESTIGATIONS

Federal funds for work done during the past fiscal year, as hereinafter described, were available from the acts of July 3, 1930; February 14, 1931; April 22, 1932; February 17, 1933; March 4, 1933; and June 16, 1933. Of $234,931.52 disbursed by the Bureau during the past fiscal year, including $35,233.97 for work under section 15 of the Boulder Canyon Project Act, and $120,824.12 for investigations with funds allotted under the National Industrial Recovery Act, $204,991.35 was provided by the United States. The projects investigated were Parker-Gila Valley in Arizona; All-American Canal and Sacramento and San Joaquin Valleys in California; Upper Snake River storage in Idaho; Frenchtown in Montana; Humboldt River in Nevada; Baker, Brogan, Deschutes, and Pendleton in Oregon; Moon Lake, Ouray Valley, Provo River, Sanpete, and Utah Lake in Utah; and North Platte River power in Wyoming.

Investigations under section 15 of the Boulder Canyon Project Act were carried on in the States of Colorado, New Mexico, Utah, and Wyoming.

TABLES

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1934*

DEBIT SIDE

Construction account:		
Primary projects:		
Cost of irrigation works:		
Original construction	$205,684,205.69	
Supplemental construction	12,627,449.22	
Value of works taken over	2,056,939.90	
Total construction cost		$220,368,594.81
Operation and maintenance prior to public notice (net)	2,804,745.00	
Operation and maintenance deficits and arrearages funded with construction	5,260,839.85	
Penalties on water-right charges funded with construction	1,696,099.49	
		9,761,684.34
		230,130,279.15
Less (income items):		
Construction revenues	6,590,769.67	
Contributed funds	1,783,013.08	
Nonreimbursable appropriation (Rio Grande Dam)	1,000,000.00	
		9,373,782.75
	220,756,496.40	
Less:		
Abandoned works, nonreimbursable cost, and charge-offs	15,615,331.70	
Balance payable		$205,141,164.70
Yuma auxiliary project:		
Cost of irrigation works	899,837.00	
Impounded funds, economy acts	504.96	
	900,341.96	
Less: Construction revenues	1,085.47	
		899,256.49
Palo Verde flood protection: Cost of reconstruction and repairs		48,917.67
Tennessee Valley Authority:		
Cost of designs	129,874.17	
Less: Contributed funds	129,874.17	
Secondary projects and general investigations:		
Cost of surveys and investigations	3,004,965.86	
Less: Contributed funds	557,371.37	
		2,447,594.49
General offices' expense undistributed		227,037.11
Plant and equipment		705,651.16
Materials and supplies		370,287.37
Accounts receivable:		
Current accounts	1,160,382.86	
Deferred accounts	154,978,178.11	
		156,138,560.97
Undistributed clearing cost accounts		39,834.19
Unadjusted debits: Disbursement vouchers in transit		36,324.63

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1934*—Con.

Cash:			
Balance on hand:			
Reclamation fund	$4,737,153.39		
Yuma auxiliary fund	148,253.80		
Special funds	119,156.25		
National Industrial Recovery—Interior—Reclamation	56,425,099.69		
		$61,429,663.13	
In special deposit and in transit		28,489.83	
			$61,458,152.96
Total debits			427,512,781.74

CREDIT SIDE

Security for repayment of cost of irrigation works:			
Contracted construction repayments		197,769,670.21	
Yuma auxiliary contracted repayments		604,885.27	
			198,374,555.48
Current accounts payable			831,058.83
Deferred and contingent obligations			1,726,831.42
Reserves and undistributed profits			7,565,940.86
Operation and maintenance results, surplus			642,595.53
Unadjusted credits: Collection vouchers in transit			275.15
Government aid for reclamation of arid lands:			
Reclamation fund		158,021,444.37	
Advances to reclamation fund:			
Treasury loan (act of June 25, 1910)	$20,000,000.00		
Less: Amount repaid	10,000,000.00		
		10,000,000.00	
Treasury loan (act of Mar. 4, 1931)	5,000,000.00		
		15,000,000.00	
National Industrial Recovery—Interior—Reclamation		59,435,000.00	
Special funds:			
Increase of compensation		2,797,960.33	
Rio Grande Dam		1,000,000.00	
Wind River Indian (Riverton)		359,176.04	
Judgments, United States courts		602,814.38	
Drainage and cut-over lands		99,815.08	
General investigations, 1923–Dec. 31, 1924		266,352.66	
Arid, semiarid, swamp, and cut-over timberlands		35,923.75	
Columbia Basin irrigation project		11,634.28	
Colorado River levee system		445,110.59	
Palo Verde flood protection		49,369.43	
		238,124,600.91	
Less: Nonreimbursable appropriation, Rio Grande Dam		1,000,000.00	
		237,124,600.91	
Less: Impairment of funds:			
Abandoned works	$1,346,244.64		
Nonreimbursable construction cost	773,296.35		
Operation and maintenance cost uncollectible	453,272.39		
Charge-offs, act of May 25, 1926	14,643,981.16		
Washington office cost since Dec. 5, 1924	1,288,134.70		
Attendance at meetings, cost	1,815.90		
Giving information to settlers, cost	2,963.88		
Prepaid Civil Service retirement fund	2,340.33		
		18,512,049.35	
		218,612,551.56	
Less: Impounded funds, economy acts, reclamation fund		241,027.09	
			218,371,524.47
Total credits			427,512,781.74

RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1934*

Items	Funds						
	Reclamation	Yuma auxiliary	Colorado River levee system	Palo Verde flood protection	National Industrial Recovery Act	Tennessee Valley Authority	Columbia Basin project
Balance on hand, July 1, 1933	$2,775,970.40	$155,657.79	$110,384.10	$6,174.51			
Receipts:							
Proceeds from sale of public lands	325,210.65						
Proceeds from oil leasing act	1,649,258.92						
Proceeds from potassium royalties	50,088.98						
Proceeds from Federal power licenses	98,450.99						
From project collections	2,301,853.15	14,181.17	1.45		$14,062.84		$81.21
From general treasury					59,435,000.00	$175,000	
Contributed funds							43,481.07
Total	7,200,833.09	169,838.96	110,385.55	6,174.51	59,449,062.84	175,000	43,562.28
Expenditures:							
Disbursements	2,326,592.66	21,321.77	51,211.84	5,381.88	3,024,094.79	113,933	42,999.29
Impounded funds, act of June 30, 1932	137,087.04	263.39	2,210.42	229.66			
Total	2,463,679.70	21,585.16	53,422.26	5,611.54	3,024,094.79	113,933	42,999.29
Balance on hand June 30, 1934	4,737,153.39	148,253.80	56,963.29	562.97	56,424,968.05	61,067	562.99

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Potassium royalties and rentals [1]	Total to June 30, 1934
	Fiscal year 1934	To June 30, 1934	Fiscal year 1934	To June 30, 1934		
Alabama			$5,549.16	$170,094.17		$170,094.17
Arizona	$30,258.35	$2,644,609.56		159.86		2,644,769.42
California	49,156.09	8,129,393.10	902,282.06	10,357,295.94	$150,055.35	18,636,744.39
Colorado	23,979.70	10,232,224.85	26,343.83	457,212.32		10,689,437.17
Idaho	16,976.58	6,987,907.29	1,948.61	14,215.25		7,002,122.54
Kansas	158.01	1,032,922.49				1,032,922.49
Louisiana			7,022.76	34,593.92		34,593.92
Montana	32,786.45	15,284,249.36	31,201.75	1,058,681.33		16,342,930.69
Nebraska	[2] 293.36	2,095,093.21				2,095,093.21
Nevada	[2] 2,101.99	1,020,944.54	84.00	4,943.37		1,025,887.91
New Mexico	68,156.33	6,561,148.29	84,877.49	420,809.46		6,981,957.75
North Dakota	658.66	12,217,303.42	9,261.88	117,659.93		12,334,963.35
Oklahoma	1,034.39	5,928,212.41				5,928,212.41
Oregon	11,034.45	11,951,265.07	1.54	11.79		11,951,276.86
South Dakota	1,744.93	7,726,220.73	230.53	1,378.08		7,727,598.81
Utah	16,014.26	4,214,409.52	35,596.56	390,370.84		4,604,780.36
Washington	3,371.30	7,440,068.45	5,208.58	33,220.46		7,473,288.91
Wyoming	72,376.50	8,541,375.13	539,650.17	32,236,408.63		40,777,783.76
Total	325,310.65	112,007,347.42	1,649,258.92	45,297,055.35	150,055.35	157,454,458.12
Proceeds, Federal water power licenses						[3] 566,986.25
Grand total						158,021,444.37

[1] Proceeds for fiscal year, $50,088.98.
[2] Contra.
[3] Proceeds for fiscal year, $98,450.99.

RECLAMATION TABLE 4.—*Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts repayable*

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages and penalties		Construction revenues, contributed funds, and non-reimbursable appropriation (contra)		Abandoned works, non-reimbursable cost, and authorized charge-offs [1]	Total repayable	
	Fiscal year, 1934	To June 30, 1934	Fiscal year, 193	To June 30, 1934	Fiscal year, 1934	To June 30, 1934	Fiscal year, 1934	To June 30, 1934		Fiscal year, 1934	To June 30, 1934
Arizona:											
Salt River	----------	$12,744,222.59	----------	$115,993.50	$43,428.40	$43,428.40	----------	$2,312,096.81	$382,097.31	$43,428.40	$10,209,450.37
Verde	$59,765.47	59,765.47	----------	----------	----------	----------	----------	----------	----------	59,765.47	59,765.47
Arizona-California: Yuma	21,169.72	9,397,900.43	$4,555.36	378,083.73	72,871.88	104,758.40	$1,286.33	227,128.44	----------	97,310.63	9,653,614.12
California: Orland	985.15	2,400,288.08	----------	[2] 11,432.99	4,420.77	5,130.48	10.89	28,414.77	----------	5,395.03	2,365,570.80
Colorado:											
Grand Valley	2,122.94	5,017,465.36	----------	138,621.28	4,249.44	4,249.44	1,000.00	269,692.83	812,374.64	5,372.38	4,078,268.61
Uncompahgre	----------	6,422,627.88	----------	311,103.02	----------	186,197.53	2.90	24,241.62	1,260,791.93	[2] 2.90	5,634,894.88
Idaho:											
Boise	----------	16,010,350.03	----------	422,283.48	47,781.46	927,297.22	38,448.88	495,124.99	82,393.84	9,332.58	16,782,411.90
King Hill	----------	1,905,918.80	----------	----------	----------	110,122.51	----------	28,187.27	497,464.06	----------	1,490,389.98
Minidoka	61,470.34	15,078,679.66	[2] 734.17	319,808.98	16,057.08	522,786.66	[2] 42,628.05	2,023,126.88	2,288.15	119,421.30	13,895,860.27
Minidoka-Gooding	49,874.18	4,172,262.10	----------	----------	12,607.43	69,021.60	----------	2,172.58	----------	62,481.61	4,239,111.12
Kansas: Garden City	----------	342,963.68	----------	52,868.10	----------	----------	----------	61,356.82	334,474.96	----------	----------
Montana:											
Bitter Root	90,000.00	717,641.05	----------	----------	----------	----------	----------	----------	----------	90,000.00	717,641.05
Huntley	----------	1,562,302.99	----------	[2] 1,000.16	19.33	387,993.95	----------	18,371.91	62,049.83	19.33	1,868,875.04
Milk River	24,626.74	6,868,744.89	[2] 68.84	437,186.74	668.41	101,062.03	----------	74,193.81	1,735,969.31	21,278.45	5,596,830.54
Sun River	87,862.55	7,471,864.86	[2] 55.65	133,078.10	935.11	103,853.45	136.00	47,535.69	89,214.47	88,606.01	7,572,046.25
Montana - North Dakota: Lower Yellowstone	----------	3,685,433.14	[2] 422.10	[2] 4,180.90	10,026.40	915,742.90	----------	53,532.47	382,254.00	9,604.30	4,161,208.67
Nebraska - Wyoming: North Platte	37,669.85	19,267,634.53	----------	743,294.42	10,885.65	1,517,431.11	56,759.82	554,661.34	----------	[2] 8,204.32	20,973,698.72
Nevada: Newlands	----------	7,956,907.07	----------	[2] 2,155.44	8,461.41	43,092.61	----------	52,347.53	4,437,820.00	8,461.41	3,507,676.71
New Mexico:											
Carlsbad	----------	1,464,649.87	----------	[2] 17,751.77	59,937.02	64,768.91	18.42	29,077.21	374,883.58	59,918.60	1,107,706.22
Hondo	----------	339,491.68	----------	32,952.01	----------	----------	----------	656.03	371,787.66	----------	----------
New Mexico-Texas: Rio Grande	55,061.04	15,131,134.43	----------	[2] 297,857.81	38,493.60	38,493.60	----------	1,408,881.64	326,900.97	93,554.64	13,135,987.61
North Dakota:											
Buford-Trenton	----------	223,423.06	----------	[2] 31.75	----------	----------	----------	1,967.62	221,423.69	----------	----------
Williston	----------	517,630.09	----------	[2] 165.00	----------	----------	1,800.00	98,906.76	418,558.33	----------	----------
Oregon:											
Baker	----------	281,591.64	----------	----------	173.09	173.09	----------	5,003.00	----------	173.09	276,761.73
Deschutes	5,361.52	5,361.52	----------	----------	----------	----------	----------	----------	----------	5,361.52	5,361.52
Stanfield	31,693.77	31,693.77	----------	----------	----------	----------	----------	----------	----------	31,693.77	31,693.77

Umatilla		5,137,937.20			108.46	230,536.78	325.14	85,646.38	888,340.82	[2] 216.68	4,394,486.78
Vale	181,721.93	3,661,102.55	8,651.49	39,048.70			2,019.47	8,144.47		188,353.95	3,692,006.78
Oregon-California: Klamath	39,193.86	6,266,645.47	1,667.83	83,244.37	10,115.43	85,086.56	5,990.61	221,943.85	7,499.72	44,986.51	6,205,532.83
Oregon-Idaho: Owyhee	1,010,734.09	12,248,374.15	336.00	336.00			24.96	4,392.93		1,011,045.13	12,244,317.22
South Dakota: Belle Fourche	2,354.42	4,521,625.11		[2] 1,989.03	10,255.46	680,198.89	[2] 1,063.68	25,087.26	379,031.58	13,673.56	4,795,716.13
Utah:											
Hyrum	172,748.02	172,748.02								172,748.02	172,748.02
Salt Lake Basin	1,745.54	2,914,526.98			4,870.82	4,870.82	29.67	45,910.77		6,586.69	2,873,487.03
Strawberry Valley		3,507,423.49		10,744.06	6,293.51	89,046.89		258,379.12		6,293.51	3,348,835.32
Washington:											
Grand Coulee	811,142.22	811,142.22					50,842.80	50,842.80		760,299.42	760,299.42
Okanogan		1,452,129.45		[2] 47,766.87		25,194.37		6,630.78	998,727.20		424,198.97
Yakima [3]	213,129.50	26,076,089.37		[2] 64,357.08	18,224.71	135,790.36	38,925.72	429,538.56	4,214.60	192,428.49	25,713,769.49
Wyoming:											
Casper-Alcova	612,398.50	612,398.50					3.00	3.00		612,395.50	612,395.50
Riverton	5,000.00	3,893,656.50			14,392.25	89,765.74	796.00	19,362.43		18,596.25	3,964,059.81
Shoshone	6,018.51	10,014,847.13	2,432.14	34,787.31	3,746.20	470,778.12	17,240.72	401,197.88	1,544,771.05	[2] 5,129.21	8,574,443.63
Total	3,583,849.86	220,368,594.81	16,362.06	2,804,745.00	399,023.32	6,956,872.42	171,969.60	9,373,758.25	15,615,331.70	3,825,032.44	205,141,122.28

[1] NOTE:

Abandoned works:

Garden City	$334,474.96
Hondo	371,787.66
Buford-Trenton	221,423.69
Williston	418,558.33
	1,346,244.64

Non-reimbursable cost: Salt River 382,097.31

Authorized charge-offs, act of May 25, 1926:

Grand Valley	$812,374.64
Uncompahgre	1,260,791.93
Boise	82,393.84
King Hill	497,464.06
Minidoka	2,288.15
Huntley	62,049.83
Milk River	1,735,969.31

Authorized charge-offs, act of May 25, 1926—Continued.

Sun River	$89,214.47
Lower Yellowstone	382,254.00
Newlands	4,437,820.00
Carlsbad	374,883.58
Rio Grande	326,900.97
Umatilla	888,340.82
Klamath	7,499.72

Authorized charge-offs, act of May 25, 1926—Continued.

Belle Fourche	$379,031.58
Okanogan	998,727.20
Yakima	4,214.60
Shoshone	1,544,771.05
	13,886,989.75

[2] Contra.

[3] Yakima-Kittitas combined with Yakima in this report.

RECLAMATION TABLE 5.—*Accounts receivable, construction water-right charges (including contributed funds)*

State and project	Due		Collected			Uncollected June 30, 1934
			Cash		Other credits to June 30, 1934	
	Fiscal year 1934	To June 30, 1934	Fiscal year 1934	To June 30, 1934		
Arizona:						
Salt River	[1] $762,451.64	$6,506,254.09	[1] $609,961.32	$6,506,254.09	----------	----------
Yuma auxiliary	[1] 995.99	593,945.51	[1] 492.28	588,374.23	$1,584.05	$3,987.23
Arizona-California: Yuma	[1] 9,553.79	3,902,932.76	[1] 41,886.56	3,379,485.78	513,286.78	10,160.20
California: Orland	[1] 20,553.63	803,575.12	[1] 9,574.43	773,323.28	----------	30,251.84
Colorado:						
Grand Valley	4,025.00	360,893.50	1,000.00	291,229.94	69,663.56	----------
Uncompahgre	90,284.04	670,681.20	----------	427,247.72	62,865.05	180,568.43
Idaho:						
Boise	[1] 17,203.33	4,000,902.55	[1] 16,926.41	3,973,709.26	27,193.29	----------
King Hill	8,000.00	90,825.66	----------	8,025.66	----------	82,800.00
Minidoka	74,646.69	8,434,674.73	34,806.61	7,775,555.99	642,648.90	16,469.84
Minidoka-Gooding	----------	280,798.48	----------	280,798.48	----------	----------
Montana:						
Huntley	1,018.08	558,699.75	985.18	467,990.30	90,630.24	79.21
Milk River	8,990.00	58,322.76	----------	3,002.76	----------	55,320.00
Sun River	1,326.60	209,279.14	1,740.00	206,233.59	3,045.55	----------
Montana-North Dakota: Lower Yellowstone	1,634.24	290,497.13	1,321.81	290,184.70	312.43	----------
Nebraska-Wyoming: North Platte	173,310.57	3,877,350.28	15,484.19	2,809,327.94	1,012,579.58	55,442.76
Nevada: Newlands	8,456.56	1,155,761.92	6,075.74	1,093,066.50	61,855.96	839.46
New Mexico: Carlsbad	1,602.25	892,951.77	1,726.61	892,797.26	81.25	73.26
New Mexico-Texas: Rio Grande	[1] 73,446.75	3,463,449.45	----------	3,151,777.81	311,671.64	----------
Oregon:						
Baker	----------	5,000.00	----------	5,000.00	----------	----------
Umatilla	625.59	539,141.38	270.55	398,461.69	5,190.89	135,488.80
Vale	----------	5,000.00	----------	5,000.00	----------	----------
Oregon-California: Klamath	[1] 2,673.59	1,115,030.62	1,029.26	1,112,569.69	1,445.87	1,015.06
Oregon-Idaho: Owyhee	----------	4,354.61	----------	4,354.61	----------	----------
South Dakota: Belle Fourche	[1] 741.29	629,309.91	[1] 1,539.68	551,035.86	78,274.05	----------
Utah:						
Salt Lake Basin	208.50	44,965.27	208.50	44,965.27	----------	----------
Strawberry Valley	[1] 26,531.17	1,287,430.30	[1] 21,312.53	1,277,677.55	9,752.75	----------
Washington:						
Okanogan	10,425.94	172,495.21	425.94	134,223.98	----------	38,271.23
Yakima [4]	[1] 252,812.59	6,656,606.08	17,343.33	6,604,553.01	36,363.75	15,689.32
Wyoming: Shoshone	342.60	827,834.51	564.92	821,367.82	6,074.33	392.36
Total	[1] 782,067.11	47,438,963.69	[1] 618,710.57	43,877,594.77	[2] 2,934,519.92	626,849.00
Paid in advance of due dates	----------	----------	732,217.92	1,144,621.71	[3] 206,768.86	----------
Refunds	----------	----------	----------	98,591.20	3,212.84	----------
Total collections	----------	----------	113,507.35	45,120,807.68	----------	----------

[1] Contra.
[2] Other credits for fiscal year, $299,260.54.
[3] Increase for fiscal year, $68,424.37.
[4] Yakima-Kittitas combined with Yakima in this report.

RECLAMATION TABLE 6.—*Accounts receivable, operation, and maintenance charges (after public notice)*

State and project	Due		Collected			Uncollected June 30, 1934
			Cash		Other credits to June 30, 1934	
	Fiscal year 1934	To June 30, 1934	Fiscal year 1934	To June 30, 1934		
Arizona: Yuma auxiliary	$18,104.92	$453,254.00	$15,320.04	$424,460.64	$13,283.75	$15,509.61
Arizona-California: Yuma	95,611.62	3,666,562.84	79,120.36	3,454,491.04	176,834.95	35,236.85
California: Orland	36,103.55	601,107.32	34,176.63	544,721.59	23,216.61	33,169.12
Colorado:						
Grand Valley	44,057.71	308,672.85	38,427.52	296,557.55	9,000.00	3,115.30
Uncompahgre	----------	1,008,683.69	----------	977,809.79	30,873.90	----------
Idaho:						
Boise	10,948.69	2,159,891.60	11,282.59	2,107,241.88	52,649.72	----------
King Hill	----------	60,711.27	----------	59,192.22	1,519.05	----------
Minidoka	40,676.50	2,015,787.72	36,462.61	1,902,930.54	112,857.18	----------
Minidoka-Gooding	2,065.85	6,923.40	[1] 287.09	4,570.46	2,352.94	----------
Montana:						
Huntley	----------	554,787.34	----------	543,594.31	11,193.03	----------
Milk River	36,259.47	297,463.58	35,299.87	271,483.36	1,662.25	24,317.97
Sun River	[1] 181.82	166,318.50	----------	161,966.28	4,352.22	----------
Montana-North Dakota: Lower Yellowstone	531.00	340,483.99	531.00	340,479.36	4.63	----------
Nebraska-Wyoming: North Platte	17,012.22	1,892,392.62	18,303.24	1,822,212.68	62,850.16	7,329.78
Nevada: Newlands	----------	1,174,581.57	----------	1,135,901.55	38,680.02	----------
New Mexico: Carlsbad	23,103.01	897,486.32	23,184.61	880,565.61	16,872.71	48.00
New Mexico-Texas: Rio Grande	247,618.52	3,785,589.34	298,330.61	3,524,584.83	227,923.61	33,080.90
North Dakota:						
Buford-Trenton	----------	2,317.41	----------	2,317.41	----------	----------
Williston	----------	34,042.75	----------	34,042.75	----------	----------
Oregon:						
Umatilla	3,209.87	382,495.32	4,689.81	375,241.36	7,253.96	----------
Vale	8,500.00	8,500.00	4,250.00	4,250.00	----------	4,250.00
Oregon-California: Klamath	47,595.16	1,239,757.12	47,394.48	1,205,309.45	30,536.22	3,911.45
South Dakota: Belle Fourche	59,534.17	1,064,809.36	59,534.17	1,055,433.37	9,375.99	----------
Utah: Strawberry Valley	----------	376,880.88	----------	365,022.21	11,858.67	----------
Washington:						
Okanogan	----------	371,441.72	----------	368,788.67	2,653.05	----------
Yakima [2]	187,362.33	5,162,419.02	316,612.77	4,977,339.12	62,308.77	122,771.13
Wyoming: Shoshone	2,842.78	551,644.51	2,906.63	526,957.56	23,705.43	981.52
Total	880,955.55	28,585,006.04	1,025,539.85	27,367,465.59	[3] 933,818.82	283,721.63
Paid in advance of due dates	----------	----------	51,584.41	69,621.89	16.53	----------
Penalties and interest	----------	----------	16,410.14	505,515.10	[4] 20,880.00	----------
Refunds	----------	----------	1,678.71	38,228.87	156.09	----------
Total collections	----------	----------	1,095,213.11	27,980,831.45	----------	----------

[1] Contra.
[2] Yakima-Kittitas combined with Yakima in this report.
[3] Other credits for fiscal year, $28,539.59.
[4] Increase for fiscal year, $400.

RECLAMATION TABLE 7.—*Accounts receivable, rental of irrigation water*

State and project	Due		Collected			Uncollected June 30, 1934
			Cash		Other credits to June 30, 1934	
	Fiscal year 1934	To June 30, 1934	Fiscal year 1934	To June 30, 1934		
Arizona:						
Salt River	----------	$2,246,726.01	----------	$2,246,726.01	----------	----------
Yuma auxiliary	$1,243.20	11,448.39	$1,205.20	11,203.39	----------	$245.00
Arizona-California: Yuma	12,005.22	538,161.88	12,382.70	524,690.70	$12,654.19	816.99
California: Orland	13.55	121,450.85	13.55	121,450.85	----------	----------
Colorado:						
Grand Valley	10,897.60	501,016.68	7,365.99	487,833.18	6,500.67	6,682.83
Uncompahgre	1,945.47	1,223,133.55	287.05	1,218,374.56	----------	4,758.99
Idaho:						
Boise	8,050.00	789,938.57	8,050.00	785,218.07	4,720.50	----------
Minidoka	51,335.65	607,776.44	51,274.15	604,338.43	3,383.01	55.00
Minidoka-Gooding	----------	13,796.00	8,860.67	13,796.00	----------	----------
Montana:						
Huntley	536.42	11,242.84	536.42	11,242.84	----------	----------
Milk River	704.00	238,023.57	704.00	227,676.79	1,208.14	9,138.64
Sun River	55.65	132,243.21	147.51	129,535.67	1,366.62	1,340.92
Montana-North Dakota: Lower Yellowstone	422.10	135,473.18	303.48	135,345.38	----------	127.80
Nebraska-Wyoming: North Platte	2,551.00	344,079.79	2,560.00	344,069.79	10.00	----------
Nevada: Newlands	----------	28,291.16	----------	22,114.31	6,176.85	----------
New Mexico:						
Carlsbad	400.00	39,824.83	400.00	39,807.58	----------	17.25
Hondo	----------	9,129.70	----------	9,129.70	----------	----------
New Mexico-Texas: Rio Grande	7,024.47	1,459,625.48	14,963.97	1,449,893.48	----------	9,732.00
North Dakota:						
Buford, Trenton	----------	31.75	----------	31.75	----------	----------
Williston	----------	2,117.28	----------	2,117.28	----------	----------
Oregon:						
Umatilla	753.70	95,656.52	753.70	69,379.72	----------	26,276.80
Vale	1,196.84	22,234.01	3,388.76	19,495.97	----------	2,738.04
Oregon-California: Klamath	38,947.35	309,475.94	38,623.65	302,857.88	25.00	6,593.06
South Dakota: Belle Fourche	368.90	9,423.38	368.90	9,405.58	17.80	----------
Utah: Strawberry Valley	----------	17,596.13	----------	17,596.13	----------	----------
Washington:						
Okanogan	----------	110,645.28	----------	108,061.09	2,584.19	----------
Yakima	2,313.85	181,071.38	2,659.65	171,491.88	----------	9,579.50
Wyoming:						
Riverton	7,659.42	23,952.91	7,361.27	21,100.69	2,812.22	40.00
Shoshone	7,332.30	76,521.90	7,095.35	75,158.18	312.25	1,051.47
Total	155,756.69	9,300,108.61	169,305.97	9,179,142.88	[1] 41,771.44	79,194.29

[1] Other credits for fiscal year, $336.56.

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1934*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102 Fixed capital under construction	$61,772,209.13	
103 Other physical properties	1,276,027.14	
104 Investigations:		
Colorado River Basin	191,138.36	
Parker-Gila project	30,070.97	
105 Other capital expenditures: Interest during construction	3,475,599.26	
Total investments (schedule 2)		$66,745,044.86

II. CURRENT AND ACCRUED ASSETS

121 Treasury cash:		
For advances to Colorado River Dam fund	36,601,438.04	
Colorado River Dam fund	149,085.58	
N.I.R.A.: Parker-Gila project	40,000.00	
Collections in transit	6,954.24	
Total Treasury cash (schedule 1)	36,797,477.86	

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1934*—Continued

II. CURRENT AND ACCRUED ASSETS—continued

122	Special fiscal agents' cash (schedule 1)	$111,441.60	
123	Special deposits	4,817.75	
124	Accounts receivable	85,526.65	
	Total current and accrued assets		$36,999,263.86

III. DEFERRED AND UNADJUSTED DEBITS

141	Clearing and apportionment accounts	* 62,603.71	
143	Field cost adjustments	21,730.79	
145	Jobbing accounts	1,033.81	
146	Prepayments	5,998.83	
171	Unadjusted debits	381,194.57	
	Total deferred and unadjusted debits		347,354.29
	Total assets and other debits		104,091,663.01

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205.1	Long-term liability: U.S. Treasury authorized appropriation	126,500,000.00	
161	Less: Authorized but not appropriated	31,840,000.00	
	Total long-term liability:		
205.2	Appropriated but not advanced	36,601,438.04	
205.3	Appropriated and advanced	58,058,561.96	
205.4	Impounded Legislative Economy Act	* 137,653.66	
206	N.I.R.A. allotment: Parker-Gila project	100,000.00	
			94,622,346.34

XI. CURRENT AND ACCRUED LIABILITIES

211	Audited accounts payable:		
211.1	Contractors' earnings: Current	1,501,427.18	
211.11	Contractors' earnings: Holdback	2,679,560.48	
211.2	Labor	45,509.78	
211.3	Purchases	391,585.85	
211.4	Freight and express	1,025,326.68	
211.5	Passenger fares	1,362.18	
211.6	Right of way purchases	11,600.00	
	Total audited accounts payable	5,656,372.15	
214	Matured interest	3,449,967.68	
220	Consumers' motor deposits	20.00	
	Total current and accrued liabilities		9,106,359.83

XII. DEFERRED AND UNADJUSTED CREDITS

224	Undistributed income items	10,130.79	
223	Special deposits	4,817.75	
226	Contributions in aid of construction	21,201.07	
231	Unadjusted credits	5,713.68	
	Total deferred and unadjusted credits		41,863.29

XV. APPROPRIATED SURPLUS

251	Appropriated surplus not specifically invested		321,093.55
	Total liabilities and other credits		104,091,663.01

* Contra.

RECLAMATION TABLE 9.—*Appropriations and cash statement, Boulder Canyon Project, June 30, 1934*

TREASURY CASH

	Appropriations	N.I.R.A. allotments	Total	Contributed funds Parker Dam	N.I.R.A. allotments Parker-Gila project
Appropriations, allotments and contributed funds	$56,660,000.00	$38,000,000.00	$94,660,000.00	$54,000.00	$100,000.00
Advances to Colorado River Dam fund	46,608,358.70	11,450,203.26	58,058,561.96		
Balance not advanced	10,051,641.30	26,549,796.74	36,601,438.04		
Colorado River Dam fund:					
Advanced from appropriation to fund	46,608,358.70	11,450,203.26	58,058,561.96		
Collections deposited in fund	188,888.36	7,644.50	196,532.86		
Total advances and collections	46,797,247.06	11,457,847.76	58,255,094.82		
Disbursements by General Accounting Office	4,710,636.06	10,212.47	4,720,848.53		
Advances to special fiscal agents	41,949,786.68	11,435,358.10	53,385,144.78	54,000.00	60,000.00
Total withdrawals	46,660,422.74	11,445,570.57	58,105,993.31		
Balance	136,824.32	12,277.19	149,101.51		40,000.00
Repay collections in transit		11.50	11.50	115.00	
Miscellaneous collections in transit	6,811.81		6,811.81		
Total treasury cash (C. L. 121)	10,195,277.43	26,562,085.43	36,757,362.86	115.00	40,000.00

SPECIAL FISCAL AGENTS' CASH

Advanced to special fiscal agents	$41,949,786.68	$11,435,358.10	$53,385,144.78	$54,000.00	$60,000.00
Appropriation transfer adjustments (credit)	10,431.32	2,481.65	12,912.97		
Disbursements by fiscal agents	41,960,218.00	11,388,238.95	53,348,456.95	27,733.91	25,737.48
Fiscal agents' checking balance		49,600.80	49,600.80	26,266.09	34,262.52
Collections by fiscal agents	199,679.77	10,137.65	209,817.42	54,240.00	
Collections desposited by fiscal agents	188,061.26	7,656.00	195,717.26	54,115.00	
Collections (appropriation transfer adjustments)	10,431.32	2,481.65	12,912.97		
Collections not deposited	1,187.19		1,187.19	125.00	
Special fiscal agents' cash balance	1,187.19	49,600.80	50,787.99	26,391.09	34,262.52

RECLAMATION TABLE NO. 10.—*Irrigation and crop rsults on Government projects, 1933* [1]

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts				
	Irrigable acreage [2]	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River	245,648	242,100	222,947	$12,393,212	$55.60	94,100	43,423	43,423	$953,000	$22.00
Arizona-California:										
Yuma	65,626	49,476	47,591	1,488,838	31.30	200	170	161	18,392	114.52
Valley division	49,522	41,019	39,411	1,175,471	30.00					
Reservation division (Indian)	8,220	3,259	3,156	60,953	19.60					
Bard division (White)	5,904	4,058	3,919	89,685	22.90					
Yuma auxiliary (Mesa)	1,980	1,240	1,105	162,729	148.00					
California: Orland	20,634	13,946	13,380	400,476	29.93					
Colorado:										
Grand Valley	30,380	15,378	15,175	329,972	21.75	18,400	13,855	13,655	382,340	28.00
Uncompahgre	75,654	60,024	59,919	1,320,129	22.03	1,650	1,550	1,545	46,350	30.00
Idaho:										
Boise	167,776	156,422	156,301	2,967,366	18.98	144,068	131,293	126,617	2,472,700	19.28
New York Irrigation District	17,000	15,688	15,645	206,002	13.17					
Nampa-Meridian Irrigation District	38,192	36,851	36,801	649,125	17.64					
Boise-Kuna Irrigation District	47,646	45,266	45,238	737,863	16.31					
Wilder Irrigation District	56,338	50,917	50,917	1,195,040	23.47					
Big Bend Irrigation District	1,718	1,345	1,345	20,611	15.32					
Black Canyon Irrigation District	6,882	6,355	6,355	158,725	24.98					
King Hill	8,269	7,293	7,137	120,343	16.85					
Minidoka	116,054	104,486	98,587	2,914,925	29.65	725,662	643,783	616,572	16,386,132	26.60
Minidoka Irrigation District	68,117	59,137	56,455	1,550,054	27.60					
Burley Irrigation District	47,937	45,349	42,132	1,364,871	32.40					
Montana:										
Bitter Root Irrigation District	18,083	15,294	14,970	235,232	15.70					
Huntley	27,947	24,369	24,369	734,189	30.12					
Milk River	134,557	46,346	46,346	909,572	19.60					
Malta division	56,652	17,606	17,606	308,734	17.50					
Glasgow division	22,133	5,482	5,482	45,372	8.30					
Chinook division	55,772	23,258	23,258	555,466	23.90					
Sun River	56,721	40,734	42,027	306,650	7.30					
Fort Shaw division	9,257	7,374	7,416	87,857	11.80					
Greenfields and Big Coulee division	47,464	33,360	34,611	218,793	6.30					

[1] Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year" October 1932 to September 1933.
[2] Areas for which Bureau was prepared to supply water in 1933.

RECLAMATION TABLE NO. 10.—*Irrigation and crop results on Government projects, 1933*—Continued

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Montana-North Dakota:										
Lower Yellowstone	46,279	33,902	33,902	$1,030,058	$30.40					
District no. 1	31,789	23,247	23,247	713,052	30.70					
District no. 2	14,490	10,655	10,655	317,006	29.70					
Nebraska-Wyoming:										
North Platte	234,609	194,451	182,504	4,759,803	26.08	127,630	108,280	104,330	$2,397,340	$22.98
Pathfinder Irrigation District	112,169	81,837	81,446	1,952,756	24.00					
Gering and Fort Laramie Irrigation District	54,827	52,356	50,471	1,650,594	32.70					
Goshen Irrigation District	51,443	47,013	38,274	1,008,074	26.30					
Northport Irrigation District	16,170	13,245	12,313	148,379	12.10					
Nevada: Newlands	87,500	53,324	50,808	621,284	12.23					
New Mexico: Carlsbad	25,055	24,624	18,761	891,044	47.49					
New Mexico-Texas:										
Rio Grande	155,000	139,206	136,509	6,148,085	45.04	77,000	43,862	43,862	1,174,337	26.77
Elephant Butte Irrigation District	88,000	79,557	77,995	3,244,001	41.60					
Rincon Valley, N.Mex	16,000	12,283	11,807	316,298	26.80					
Mesilla Valley, N.Mex	72,000	67,274	66,188	2,927,703	44.20					
El Paso County Water Improvement District No. 1	67,000	59,649	58,514	2,904,084	49.60					
Mesilla Valley, Tex	56,000	9,787	9,644	474,004	49.20					
El Paso Valley, Tex	11,000	49,862	48,870	2,430,080	49.70					
Oregon: Baker	7,124	6,303	6,282	71,264	11.34					
Umatilla	13,444	11,342	10,964	173,011	15.84	729	691	671	15,828	23.60
East division	7,964	7,240	6,956	108,076	15.50					
West division	5,480	4,102	4,008	64,935	16.20					
Vale	15,854	4,982	4,081	91,958	22.53					
Oregon-California:										
Klamath	61,262	51,963	51,355	1,607,633	31.10	64,813	32,930	32,930	783,888	23.60
Main division	41,049	32,293	31,917	1,020,988	32.25					
Tule Lake division	20,213	19,670	19,438	586,645	30.03					
South Dakota: Belle Fourche	61,030	42,060	47,379	723,580	15.27					
Utah:										
Salt Lake Basin						87,754	87,753	83,954	3,349,381	39.90
Strawberry Valley	42,055	39,269	37,838	725,856	19.18	5,207	4,970	4,936	112,409	22.77
High line division	18,893	17,753	16,717	224,315	13.40					
Spanish Fork division	14,083	13,029	12,655	274,926	21.70					
Springville-Mapleton division	9,079	8,487	8,466	226,615	26.80					

Washington:										
Okanogan	5,800	3,712	3,441	371,898	108.06					
Yakima	204,409	156,946	146,073	5,991,571	41.05	166,717	126,186	126,186	7,330,224	58.09
Sunnyside division	102,432	85,728	79,214	3,101,455	39.15					
Tieton division	29,977	26,640	23,850	2,078,394	87.10					
Kittitas division	72,000	44,578	43,009	811,722	18.85					
Wyoming:										
Riverton	32,000	4,184	3,723	41,295	11.09	271	271	271	3,549	13.10
Shoshone	66,738	47,534	47,534	769,332	16.19					
Garland division	41,649	30,144	30,144	609,547	20.20					
Frannie division	13,220	13,094	13,094	121,274	9.30					
Willwood division	11,869	4,296	4,296	38,511	9.00					
Total with irrigation	2,025,508	1,589,770	1,529,903	48,138,576	31.45	1,514,201	1,239,017	1,199,113	35,425,870	29.50
Cropped without irrigation										
Milk River project			7,550	16,040	2.10					
Malta division			3,535	8,508	2.40					
Glasgow division			4,015	7,532	1.90					
Sun River project			1,586	4,152	2.60					
Fort Shaw division			43	393	9.10					
Greenfields and Big Coulee division			1,543	3,759	2.40					
Lower Yellowstone project			2,979	7,384	2.50					
District no. 1			1,797	4,766	2.65					
District no. 2			1,182	2,618	2.20					
Klamath project			56,684	599,711	10.55					
Total cropped without irrigation			68,799	627,287	9.10	1.514,201	1,239,017	1,199,113	35,425,870	29.50
Grand totals	2,025,508	1,589,770	1,598,702	48,765,863	30.50					
Grand totals of projects proper and Warren Act	3,539,709	2,828,787	2,797,815	84,191,733	30.10					

GENERAL LAND OFFICE

(Fred W. Johnson, Commissioner)

The General Land Office was charged by Congress on April 25, 1812, with the survey and disposal of the public land. Historically and actually, it is the legal, title, and record bureau for the lands of the Federal Government. It collaborates closely with seven interdependent bureaus having to do with public land withdrawn for national forests, parks, mineral resources, reclamation, water power, wildlife, and the Indians. It adjudicates all public land and mineral land questions within withdrawals, forests, and other reservations. During the fiscal year there were noted on the public-land tract books 683 orders of a withdrawal or restoration nature varying in size from a single tract to more than a million acres.

The General Land Office maintains 25 district land offices in the western public land States and Alaska for the convenience of the public. Entries in States without district land offices are made directly in this office. The surveying and mapping is conducted by the Cadastral Engineering Service under a supervisor of surveys at Denver, Colo., an associate supervisor of surveys at Washington, and eight district Cadastral engineers. Twelve public survey offices contain the local survey records for public use.

The General Land Office is a hall of records on the disposition of the public domain—76 percent of the United States proper. Its 4,300 tract books contain the base title record and status of every 40-acre tract from the Ohio to the Golden Gate and from Canada to Texas, the Gulf, and Old Mexico. They are the index to 8,772,793 original record files. Additional are 7,392,345 files of letters, withdrawals, and miscellaneous actions and 11,880,780 index cards. Copies of the 6,056,146 patents are bound in 9,400 volumes. The base of the survey records is 6,099 volumes of field notes and approximately 100,000 township plats. The photo-lithographic copies of the plats, and to a lesser extent the field notes, are in demand by private parties and the public authorities for areas up to counties and entire States. During the fiscal year there were sold 7,060 plats for $3,530 and 5,761 were disposed of officially. The public survey offices were paid $2,322.40 for copies of records. The General Land Office received during the year 24,832 letters regarding old records and patents. There were furnished 63,382 certified copies at a charge of $18,033.30, and 25,355 uncertified copies for official use. A large part of this business was due to farm loans and transfers requiring a perfect chain of title on the county records. Included were 14,228 pages of survey field notes.

The course of public land business during the past decade is shown by acres in the following table.

Fiscal year	New entries and applications								Pending entries on June 30	Vacant public land on June 30 (United States proper)
	Homesteads (original)	Deserts (original)	Timber and stone applications	Mineral application	State selections	Railroad selections	All others [1]	Total		
1925	3,188,686	61,889	26,889	49,827	184,908	189,092	73,500	3,774,791	33,018,910	----------
1926	3,001,403	47,171	16,614	67,332	102,110	86,489	86,599	3,407,718	28,129,876	196,056,747
1927	3,359,182	35,534	20,361	35,791	176,049	14,092	98,437	3,739,446	28,028,292	193,737,588
1928	3,464,775	40,447	15,187	91,329	95,254	106,454	73,617	3,887,063	23,282,994	193,847,240
1929	4,311,591	28,555	13,054	27,377	238,023	15,242	91,819	4,725,661	21,347,505	189,854,407
1930	4,920,842	33,355	11,878	30,133	281,443	78,363	155,886	5,511,900	22,533,574	178,979,446
1931	4,924,046	32,826	5,945	19,776	84,684	77,539	174,210	5,319,026	24,241,042	177,101,551
1932	4,049,854	15,598	3,213	13,484	412,084	60,844	53,513	4,608,590	24,164,842	173,318,246
1933	2,714,029	10,111	2,050	4,900	369,973	11,590	31,695	3,144,348	23,208,074	172,084,580
1934	2,862,143	6,456	1,420	4,884	662,689	43,146	55,491	3,636,229	24,040,779	165,695,479

[1] Includes final entries which never appear as original entries.

The following is a résumé of the public land entered and disposed of during the fiscal year 1934. The Indian land is mainly the ceded Ute land in western Colorado, subject to entry upon payment of $1.25 per acre for the Indians.

ORIGINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stockraising	4,990	2,502,926	146	64,962
Enlarged	310	75,208	9	2,150
Reclamation	44	5,090	41	4,600
Forest	38	2,931	----------	----------
Sec. 2289, et al	2,125	201,058	38	3,217
Total homesteads	7,507	2,787,213	234	74,929
Deserts	65	6,433	1	23
State selections	1,005	662,689	----------	----------
Railroad selections	17	43,146	----------	----------
Applications and filings	145	----------	9	----------
Miscellaneous	56	10,444	23	6
Total	8,795	3,509,925	267	74,958
Indian land as above	267	74,958	----------	----------
Grand total	9,062	3,584,883	----------	----------

FINAL ENTRIES

Homesteads:				
Stockraising	2,104	916,945	48	20,457
Enlarged	373	93,413	34	7,414
Reclamation	187	17,284	16	1,405
Forest	51	5,280	2	258
Commuted	19	1,721	57	3,953
Sec. 2289, et al	893	90,751	64	5,990
Total homesteads	3,627	1,125,394	221	39,477
Deserts	57	6,270	3	429
Public auction	91	7,202	6	661
Timber and stone	24	1,573	----------	----------
Mineral	81	7,004	----------	1
Miscellaneous	1,419	35,620	91	1,401
Total	5,299	1,183,063	321	41,969
Indian land as above	321	41,969	----------	----------
Grand total	5,620	1,225,032	----------	----------

PATENTS AND CERTIFICATIONS

	Number	Acres
Homesteads:		
Stockraising	1,507	726,859
Enlarged	323	82,589
Reclamation	283	23,224
Forest	71	7,264
Commuted	17	1,668
Sec. 2289, et al	730	74,970
Total homesteads	2,931	916,574
Deserts	62	7,567
Public auction	122	9,970
Timber and stone	20	1,430
Mineral	110	22,021
Railroad	22	64,567
Miscellaneous	2,249	266,403
Total patents	5,516	1,288,532
Certified to States	----------	106,920
Grand total	----------	1,395,452

LEASES AND PERMITS OUTSTANDING ON JUNE 30, 1934

	Licenses		Permits		Leases	
	Number	Acres	Number	Acres	Number	Acres
Oil and gas	----------	----------	5,238	8,435,533	848	294,720
Coal	105	4,244	275	205,549	350	69,332
Potash	----------	----------	200	420,682	12	29,465
Sodium	----------	----------	38	51,603	1	640
Phosphate	----------	----------	----------	----------	8	4,233
Sulphur	----------	----------	22	12,857	----------	----------
Nonmineral excluding grazing	----------	----------	----------	----------	78	172,330
Total	105	4,244	5,773	9,126,224	1,297	570,720

RECEIPTS AND EXPENDITURES

The cash receipts were $4,035,441.08 as shown by accompanying table, an increase of $176,010.11 over the previous year. The expenditures paid through this office and before final settlement in the General Accounting Office were $2,013,235.39.

Source of receipt	Distribution in the treasury			
	General fund	Reclamation fund	State fund	Total
Sale of public lands	$34,179.15	$60,911.57	$4,047.62	$99,138.34
Fees and commissions	70,986.10	189,235.00	----------	260,221.10
Bonuses, rentals, and royalties from mineral leases	342,323.98	1,682,695.34	1,201,925.24	[1] 3,226,944.56
Proceeds of land and timber in Oregon and California railroad grant	----------	----------	269,026.28	[2] 269,026.28
Proceeds of land and timber in Coos Bay wagon road grant	4,038.67	----------	[3] 1,060.97	5,099.64
Fees from copies of records	18,819.29	----------	----------	18,819.29
Royalties on coal leases in Alaska	5,277.67	----------	----------	5,277.67
Royalties and rentals from potash deposits	----------	57,159.64	----------	[4] 57,159.64
Power permits	15,275.00	----------	----------	15,275.00
Sale of reclamation town sites	----------	2,731.75	----------	2,731.75
Sale of standing timber in Alaska	5,486.82	----------	----------	5,486.82
Miscellaneous (surveying fees, rent of lands, proceeds of Government property, etc.)	8,846.94	----------	----------	8,846.94
Total	505,233.62	1,992,733.30	1,476,060.11	3,974,027.03
Sales and leases of Indian lands	----------	----------	----------	[5] 61,414.05
Aggregate	----------	----------	----------	4,035,441.08

[1] First and fourth columns contain $20,319.93 royalties received in Wyoming under the act of June 26, 1926.
[2] This amount is payable to certain counties in Oregon in lieu of taxes.
[3] Amount payable to Coos County, Oreg., 25 percent of proceeds of land and timber.
[4] Potash royalties on permits and leases issued under the act of Feb. 7, 1927 (44 Stat. 1057), are deposited as "Receipts under the mineral leasing act" and distributed accordingly.
[5] Of the amount received as royalties from oil lands in the bed of Red River, Okla., 37½ percent, $12,007.23, is paid to Oklahoma, and the balance, $20,012.03, is credited to the Kiowa, Comanche, and Apache Indians.

SURVEYING AND MAPPING

The Cadastral Engineering Service of this office performs practically all surveys for title purposes within the original public land States for the various Federal bureaus and departments, and is thus one of the great governmental surveying services. Its organization plan with 144 members remained unchanged, but was automatically expanded to meet two new situations. First, the surveying operations under the Federal Emergency Administration of Public Works initiated September 30, 1933, added 54 transitmen, 28 clerks and draftsmen, and a monthly average of 341 temporary field assistants. It gave a total of 770,945 man-hours of work. Second, from December 12, 1933, to April 30, 1934, there was employed a weekly average of 460 transitmen, field assistants and clerks under Civil Works Administration directed by this service, and providing 254,680 man-hours of work. The relief funds were used on important projects requiring a maximum number of workers and that had been long contemplated or had been requested by other bureaus.

Surveys and resurveys were made under 244 groups in 23 States and Alaska. Such work as can be measured on a quantity basis equaled 35,970 linear miles or 6,290,089 acres surveyed, composed as follows. Approximately 2,300,000 acres of public land were surveyed (sectionized) and 1,300,000 acres resurveyed. Surveys for the Forest Service were 1,200,000 acres of original surveys and 916,000 acres of resurveys. Resurveys amounting to 527,800 acres were made for the Reclamation Service. Lesser areas were surveyed for the National Park Service, United States Geological Survey, War Department, Office of Indian Affairs, and Federal Power Commission. Some of the work were the special determinations and the fragmentary and miscellaneous surveys, involving little acreage, which increase with time and require an undue amount of investigation and work for the results produced. Such work was postponed as much as possible because of the relief situation, and this partly explains why the comparable figure for 1933 was 19,364 linear miles surveyed. Surveying for Indian reservations was restricted to emergency work. Nearly all of Alaska and 133,562,439 acres within the United States proper are yet unsurveyed.

The expenditures were $193,062.44 from the regular appropriation for surveying the public land, $735,527.43 from the Public Works fund, and $25,201.73 from miscellaneous sources, a total of $953,-791.60. In addition, approximately $219,600 was expended from the Civil Works funds. This compared with a total expenditure in 1933 of $521,829.81 from the regular surveying funds.

The official map of the United States has been revised for a new edition. The new state maps of Idaho and Oregon and more recently Arizona have arrived in stock, while the new maps of Alaska and Colo-

rado have been sent to the printer. Maps mounted were 1,927 and distributed were 5,293. Public land circulars and regulations distributed were 165,366.

HOMESTEADS

Allowed original homestead entries in acres reached their lowest level in December 1932, since 1869. New homestead entries in the fiscal year 1934 were about 92½ percent of those in 1925 and 1926, and the new filings mounted rapidly in the last half. The total pending and unperfected homestead entries on June 30, 1934, were 54,020 entries embracing 19,883,591 acres. Seventy percent of this acreage is, in descending order, in the Rocky Mountain States of New Mexico, Wyoming, Montana, and Colorado.

The homestead division of this office during the year acted upon the following cases, exclusive of Indian land.

Incoming original entries	8, 906	Appeals	14, 375
Approved for patent	4, 098	Contests	1, 755
Application to make second entry	1, 110	Timber and stone applications	136
Application to amend entry	670	Public sale applications	420
Leaves and extensions	3, 013	Total	34, 483

The above compares with 28,406 cases in 1933 and 26,555 in 1932. There were received and disposed of 46,259 related and unrelated letters against 59,035 in 1933, and 65,667 in 1932. The number of these letters has doubled since 1930.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—During the year 1,226 cases received office action. There were issued 36 leases embracing 38,555 acres under section 14 of the leasing act as a result of discoveries of oil and gas on prospecting permits. One lease was granted under section 17 on a bonus bid of $11,000 at a sale of leases in the Rodessa Gas Field in Louisiana. The defined geologic structures of the following six producing oil and gas fields were promulgated: Dry Creek, North Bowes and South Bowes in Montana; North Eunice (additional) in New Mexico; La Barge and Lake Creek in Wyoming. A unit plan of development and operation of Middle Dome in the Kettleman Hills field of California was approved on September 30, 1933, and 10 leases covering 4,537 acres were issued. The instructions of December 4, 1933, require leases thereafter to include an agreement to abide by the Code of Fair Competition for the Petroleum Industry. The act of June 16, 1934, provides for the use of water from water wells drilled by permittees and lessees through reserving as a public watering place the land on which the well is situated. The number and acres of outstanding leases and permits for all minerals are shown in the earlier table on disposals.

Oil and gas prospecting permits.—There were filed 1,583 new applications for oil and gas permits. Permits granted were 907, of which 12 were in Alaska. Permits canceled were 231. Applications entirely rejected were 676 and in part were 807. Nine canceled permits were reinstated, and 153 assignments and 1,443 applications for extension of time were considered. The total cases examined for some office action were 14,087.

Coal.—A total of 2,784 cases were acted upon. There were issued 52 coal prospecting permits for 30,207 acres, 26 licenses for 1,010 acres to mine coal, and 31 coal leases for 1,916 acres.

Potash, sodium, sulphur, and phosphate.—Cases acted upon were 803. There were issued 14 potash permits involving 30,907 acres, 19 sodium permits for 25,755 acres, 1 sodium lease for 640 acres and 38 permits for 51,603 acres, and 22 sulphur permits for 12,857 acres.

Receipts under mineral leasing acts.—The receipts for the year under the act of February 25, 1920, were $2,892,498.47 from oil and gas, $234,497.34 from coal, $75,064.95 from potash, $4,460.61 from phosphate, and $103.26 from sodium, a total of $3,206,624.63. These receipts were obtained from the following State areas:

Alabama	$10,614.60	North Dakota	$16,817.61
California	1,672,953.58	South Dakota	401.40
Colorado	50,474.91	Utah	68,266.34
Idaho	3,352.19	Washington	9,645.19
Louisiana	13,927.31	Wyoming	1,134,711.74
Montana	59,842.19		
Nevada	160.00	Total	3,206,624.63
New Mexico	165,457.57		

The total receipts from date of act to June 30, 1934, are $90,181,750.52. Each State receives 37½ percent of the receipts arising within its borders, the reclamation fund receives 52½ percent, and the remaining 10 percent is retained in the United States Treasury under miscellaneous receipts. During the year there was received $20,319.93 in royalties in Wyoming under act of June 26, 1926, and $5,277.67 from coal royalties in Alaska, all of which was retained in the Treasury. The royalties from oil lands in the bed of Red River in Oklahoma were divided 37½ percent or $12,007.23 to the State and balance, $20,012.03, to Kiowa, Comanche, and Apache Indians. The potash royalties and rentals in California under act of October 2, 1917, were $11,945.71 and those in New Mexico under act of February 7, 1927, were $45,213.93, all of which went to the reclamation fund.

Contests against oil-shale locations.—Action has been suspended since April 1, 1933, awaiting court decision on jurisdiction of the Department to challenge the validity of oil-shale locations for failure to perform annual labor thereon. There are pending 503 Government contests against such locations.

Oil-shale claims under patent proceedings.—Four oil-shale entries covering 3,648 acres were approved for patent, 2 entries for 1,919 acres were canceled and 8 entries for 6,343 acres are still pending.

Mineral entries other than oil-shale.—Mineral applications disposed of were 172. Final mineral entries acted upon were 333, of which 115 were approved for patent. There were disposed of 653 highly miscellaneous mineral cases not involving mineral entry.

San Gabriel and Boulder Dam locations.—The cities of Los Angeles and Pasadena were granted reservoir rights in San Gabriel Canyon in the Angeles National Forest of southern California. Field investigation in recent years reported 429 recorded mining locations as invalid. After hearings asked for on several claims, all were finally canceled except two locations still undisposed of. Field investigation was made in the past of some 3,000 recorded mining locations in the area reserved for the Boulder Dam and Reservoir site. Four locations were reported valid and together with some patented claims are under appraisal. Thirty locations were declared to be null and void after hearing, 8 are still on appeal from adverse decision, and balance of the 3,000 locations have been canceled save 1 undisposed of. Essentially, the two investigations cleared the record of long abandoned mining locations that might be made the basis of damage suits.

Coal-bed fires.—The work in controlling fires on the outcrop of coal beds on the public land near Gillette, Wyo., which was carried on by a Civilian Conservation Camp during the summer of 1933, has been continued this summer.

EXCHANGES

Various acts provide for relinquishing private land useful for governmental purposes in exchange for public land or timber. The Santa Fe Pacific Railroad Co. (Atlantic and Pacific grant) exchanged 124,941 acres in northwestern New Mexico to benefit the Navajo Indians, and 3,833 acres to enlarge the Petrified Forest National Monument in Arizona. Title to 67,919 acres of private land within national forests was so obtained, including 41,444 acres of the Mora Grant in the Lincoln National Forest in New Mexico. There were likewise added 7,780 acres to various Indian reservations. Forest lieu selection under act of June 4, 1897, has reduced to a few hundred acres annually.

GRAZING

One grazing lease of 1,408 acres was issued in Alaska, making 18 leases outstanding for 10,550,857 acres. Six of these leases are to associations of natives for grazing reindeer.

The act of March 4, 1931, withdrew 334,765 acres for the protection of the water supply of Los Angeles and other cities. This is the area now being administered as the Owens River-Mono Basin Grazing

Reserve, and about 70 free-use permits are outstanding. Subsequent Executive orders added 266,600 acres for water supply protection, and during the fiscal year another 265,000 acres were so added.

The only other grazing district is the Mizpah-Pumpkin Creek Grazing Reserve in Custer County, southeastern Montana. An association of local cattlemen was formed and on May 9, 1932, a lease was issued for approximately 25,124 acres at an annual rental of $785.

Two withdrawals for proposed grazing districts have existed since 1931 in Montana, the South Sunday Creek area in Rosebud and Custer Counties estimated at 192,320 acres, and the Crooked and Gilbert Creeks area in Garfield County estimated at 175,000 acres. The departmental order of September 26, 1933, withdrew approximately 1,837,400 acres in Uintah County, Utah, for a proposed grazing district for the Uncompahgre Ute Indians and the white settlers within the area, of which about 1,280,312 acres is public land. Public Grazing Withdrawal No. 4 of February 6, 1934, withdrew 1,221,120 acres 60 miles southwest of Salt Lake City, of which about 1,000,000 acres is public land.

MISCELLANEOUS LEASES

Six leases were issued for public aviation fields. There are now outstanding 19 such leases totaling 10,033 acres and 5 permits aggregating 5,197 acres for beacon lights. Recreational area leases to States, counties, or municipalities number 14 for 14,065 acres. One hot springs lease for 39 acres exists. Five fur farming leases amounting to 6,600 acres were issued in Alaska, bringing total to 44 leases for 148,193 acres.

RIGHTS-OF-WAY

Thirteen railroad rights-of-way were approved and requirements made in 38 more, all as amendments or extensions of existing systems. Rights-of-way approved for irrigation, pole lines, public roads, and pipe lines numbered 342 and requirements were made in 695 cases more. There were promulgated 74 approved rights-of-way in Indian reservations.

FEDERAL RECLAMATION

There are 32 Federal reclamation projects in 14 western States and 5 Indian reclamation projects. The gross area withdrawn during the year under the Reclamation Act was 850,880 acres and 850,815 acres heretofore withdrawn were restored. Additionally there were withdrawn under the act of June 25, 1910, at the request of the War Department 204,720 acres for the Fort Peck project in Montana

and 79,080 acres for the Bonneville Dam in Oregon and Washington, both Public Works Administration projects. The Fort Peck project is in aid of the Missouri River Basin flood control, irrigation, navigation, and power development. The new openings to entry under Reclamation Act were 1 farm unit of 115 acres in the Shoshone project (Wyoming) and 26 farm units totaling 1,700 acres in the Yakima project (Washington). The average life of a reclamation homestead from entry to patent is upwards of 10 years. The reclamation homestead patents in the decade of 1915–24 were 5,658 patents for 422,624 acres, while in the 1925–34 decade there were 1,966 patents for 162,398 acres. During the 1925–34 period there were 865 original entries for 89,969 acres. The number of entries and patents during 1934 is shown elsewhere. Old and new entries under the Reclamation Act totaling 1,795 were examined in the office for some action.

CAREY ACT

Section 4 of the act of August 18, 1894, and its 23 supplemental acts are collectively known as the Carey Act. The act grants to certain arid-land States one to three million acres each of desert land upon condition of large scale reclamation. Land for this purpose is either segregated or is temporarily withdrawn for investigation. Patents are issued only on proof that water has been made available for irrigation. To June 30, 1934, there were segregated 3,897,860 acres, out of which 1,102,586 acres have been patented, 2,575,678 acres have been returned to the public land, and 219,596 acres remain segregated of which 42,322 acres are under proof of reclamation. The area now under temporary withdrawal is 668,675 acres, as follows:

State	Withdrawals	Segregations	State	Withdrawals	Segregations
Arizona		13,745	Oregon		56,813
Colorado	35,824		Wyoming		105,007
Idaho	632,851	43,078			
Montana		953	Total	668,675	219,596

Construction work on Carey Act projects has been largely in abeyance for 4 years, mainly for economic reasons. During the year 738,131 acres of Carey Act land received some necessary office action. There were filed patent applications for 3,724 acres and segregation application was made for 2,242 acres.

SWAMP AND OVERFLOWED LAND

Four applications under this act were made during the year by the State of Louisiana and four by California. The State of Oregon received patent for 21,431 acres in the Warner Valley and 6,800 acres went to other States. Among pending applications is one by the State

of Wisconsin for approximately 43,737 acres within the Lac du Flambeau, Bad River, and Menominee Indian Reservations upon some of which allotments and patents have issued to Indians; various questions of fact, record, and law are involved.

STATE SELECTIONS

These are composed of quantity or acreage grants for specific purposes and of indemnity lands selected in lieu of school sections lost to the State through mineral character or prior occupation or reservation. Ninety percent of the selections during the past 5 years have been for indemnity lands. The selections filed during the fiscal year are as follows in acres:

State	Quantity	Indemnity	State	Quantity	Indemnity
Arizona	80	589,747	Oregon	----------	119
California	----------	557	Utah	49,894	719
Colorado	----------	114	Washington	----------	240
Idaho	----------	640	Wyoming	----------	80
Montana	----------	1,878			
New Mexico	7,152	11,469	Total	57,126	605,563

The pending old and new selections examined in the office during the year amounted to 920,146 acres, of which 9,485 acres were canceled, 106,921 acres were certified to the States and further requirements were made on the remainder.

RAILROAD LANDS

Nine out of the 72 unforfeited railroad grants remain to be closed: Atlantic and Pacific (western division), Southern Pacific (branch line), Southern Pacific (main line), Northern Pacific, Central Pacific, California and Oregon, Cairo and Fulton, Memphis and Little Rock, and St. Paul and Pacific.

Adjustment of the Northern Pacific grant has been suspended pending court decision on the company's rights. There are outstanding approximately 3,000,000 acres of primary and indemnity lands unapplied for. Most of this is within the Atlantic and Pacific grant in Arizona and New Mexico, and the Southern Pacific (branch line) grant in California. Lack of surveys and inclusion within Indian reservations are largely responsible for this situation. During the fiscal year the following new selections were filed: 16,547 acres in Arizona, 26,339 in New Mexico, 179 acres in California, and 40 acres each in Montana and Washington. Office action during the year approved 63,671 acres to the companies, rejected 684 acres, and made further requirements on 194,099 acres.

OREGON AND CALIFORNIA RAILROAD GRANT LAND

The act of June 9, 1916, revested in the United States approximately 2,800,000 acres of land formerly granted to the Oregon &

California Railroad Co., with provisions for classification and disposition thereof and for disposal of the moneys received. During the year 20,379 acres were homesteaded and 10,752 acres of former entries were canceled. There were 70 timber sales involving 5,238 acres and aggregating $252,967. These lands are situated in western Oregon and inventoried as follows on June 30, 1934: (1) 1,128,326 acres of unsold timberland containing 30,305,628,000 board-feet of timber; (2) 105,098 acres on which timber has been sold and included in which are 18,444 acres of cut-over land subject to entry and 10,951 acres of pending entries (and 2,280 acres patented); (3) 56,231 acres of power-site land containing 824,321,000 board-feet of timber; (4) 8,360 acres of recreational land; (5) 752,582 acres of agricultural classification subject to entry; (6) 84,197 acres of agricultural classification in pending entries, and (7) 528,004 acres within the indemnity limits of the grant and within the boundaries of national forests remain unclassified. The area associated with (1) and (2) that is listed as unrestored timberland is 1,201,749 acres. This land will be restored to entry as agricultural land of cut-over character as the timber is sold, cut, and removed.

COOS BAY WAGON ROAD GRANT LAND

Under the act of February 26, 1919, there were reconveyed to the United States approximately 90,000 acres of land formerly granted to the Coos Bay Wagon Road Co. in western Oregon. The land was to be classified and disposed of in the manner prescribed by the act of June 9, 1916, and the resulting moneys as prescribed by the act of February 26, 1919. During the year 2,100 acres were homesteaded and 520 acres of former entries were canceled. There were two timber sales involving 120 acres and aggregating $4,700. These lands inventoried as follows on June 30, 1934: (1) 40,735 acres unsold timberland containing 1,551,083,000 board-feet of timber; (2) 15,229 acres on which timber has been sold and included in which are 4,195 acres of cut-over land subject to entry and 2,462 acres of cut-over land in pending entries (and 200 acres patented); (3) 4,464 acres of power-site land containing 181,460,000 board-feet of timber; (4) 14,900 acres of agricultural classification subject to entry; and (5) 7,197 acres of agricultural classification in pending entries. The unrestored timberland withdrawn from agricultural entry is 49,107 acres.

MISCELLANEOUS

Some 4,712 highly miscellaneous cases were acted upon and 1,459 patents were approved, which involved Indians and Indian land (land subject to certain public land entries with proceeds to Indians), and Indian reservations, pueblos, allotments and exchanges. Soldiers' additional homestead rights were granted in certain cases to Civil War veterans and their widows and minor children; 20 entries under

these rights covering 419.13 acres were patented and it is believed that several thousand acres of these rights are still outstanding. Action was taken on 1,271 trespass cases involving timber, coal, turpentine, and gravel. Sales of land in abandoned military reservations amounted to $2,988.16 for 1,675.92 acres. Patents were approved for 189 town lots in 25 town sites. Desert-land cases receiving office action were 1,451, of which 76 were approved for patent and 110 were canceled.

Congress has directed that the Commissioner of the General Land Office and the Secretary of the Interior shall constitute a Board of Equitable Adjudication to adjudge if patents may issue in accordance with equity and justice where some obstacle has arisen through mistake, ignorance, or cause beyond control of the entryman. During the fiscal year patents were so confirmed on 643 homesteads, 38 deserts, and 1 mineral entry.

There were decided 2,152 Government and private contests and at the end of the fiscal year there were pending unadjudicated 503 oil-shale contests, 77 mineral contests, and 442 miscellaneous contests. There were enacted 49 public and private acts of Congress affecting the activities of this office, and 328 such acts during the last 5 years.

WITHDRAWALS

Nine new stock driveways were established and 41 were modified during the year. The net area of the national forests in the public-land States was increased 532,983 acres. There were temporarily withdrawn 6,486 acres for forest purposes and 80 acres were restored. The national forests in the public-land States have a gross area of 159,978,063 acres, of which 138,120,193 acres or 86.3 percent is net Government land. Those in Alaska are 21,342,300 acres net after deducting 54,633 acres of private land. Two national monument changes were made. The Pinnacles in California was increased 5,002 acres and Cedar Breaks in Utah was created by exclusion of 5,821 acres from the Dixie National Forest. Six recreational area withdrawals were made on petitions by States or cities. Forty acres for this purpose were sold to Pima County and 538 acres leased to Mohave County, Ariz. Additions to bird and game refuges amounted to 133,426 acres and 56,270 acres were withdrawn for creation of further refuges. The existing refuges in the public-domain area aggregate 1,512,371 acres and 162,691 acres are withdrawn for further refuges, both mainly within other withdrawals and reservations.

Among the withdrawals during the year were 265,000 acres for the Los Angeles water supply, 1,162,286 acres for investigation with a view to creating a national monument perpetuating desert plant life and 80,000 acres for a bombing and gunnery range for the War Department, all in California. In New Mexico, 441,000 acres were withdrawn to enable the State to select land in lieu of school sections and

other State land within national forests. In Oklahoma, 4,858 acres were withdrawn pending legislation for relief of bona fide claimants, and 6,360 acres in Nevada for flood and erosion control. The withdrawal situation is as follows:

	Withdrawn in 1934	Restored in 1934	Pending withdrawn June 30, 1934
Stock driveways	124,009	15,529	9,771,386
Recreational area withdrawals	2,409	----------	284,285
Air navigation sites	1,675	2,885	32,880
Carey Act withdrawals	----------	----------	668,675
Carey Act segregations	----------	----------	219,596
Reclamation withdrawals	850,880	850,815	20,208,621
San Carlos irrigation project (Indian)	----------	----------	136,860
Fort Hall irrigation project (Indian)	----------	1,280	114,720
Fort Peck project, Montana	204,720	----------	204,720
Bonneville dam, Oregon-Washington	79,080	----------	79,080
Water-power reserves (non-Indian)	257,954	20,983	5,147,654
Reservoir and well sites	----------	----------	254,130
Public water reserves	11,027	1,720	480,708
Los Angeles water supply [1]	265,000	----------	866,365
Mizpah-Pumpkin Creek grazing district	----------	----------	25,124
Grazing withdrawals	3,058,520	----------	3,425,840
Oregon-California and Coos Bay unrestored timberland	----------	10,615	1,250,856
Created into national forests in 1934	192,095	----------	----------
For Boulder Canyon transmission line	----------	179,040	1,861,170
For forest exchange with New Mexico	441,000	----------	681,000
For game and bird refuges	56,270	----------	162,691
For national forest purposes	6,486	80	134,653
For national parks and monuments	1,162,286	81,945	3,943,497
For New Mexico-Arizona Indian consolidation	----------	----------	1,134,972
For military firing range	80,000	----------	(2)
For agricultural experiment stations	----------	----------	310,179
For flood and erosion control	6,360	----------	15,720
For State game refuge investigation	----------	----------	73,080
For recreational investigation	----------	----------	43,793
For irrigation-power investigation	----------	----------	30,880
For archaeological investigation	----------	----------	11,090
For miscellaneous purposes	5,564	----------	11,042
	6,805,335	1,164,892	51,585,267

[1] Includes Owens River-Mono Basin grazing district.

[2] Excluded.

It is estimated that the 51,585,267 acres of withdrawals contain 30,442,832 acres net of Government land in the public-domain States.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

Mineral withdrawals must be completely separated in idea from other withdrawals. They relate to subsurface rights as the surface is usually open to agricultural entries unless a reservation of the surface is also necessary to effect the purpose of the withdrawal. The changes during the year were 1,323 acres of helium land in Utah withdrawn, while the restorations were 936,433 acres of coal land withdrawals in New Mexico and 136 acres of other withdrawals. The acreage now classified or withdrawn for classification, which includes much land patented without mineral reservation, is as follows:

	Withdrawn	Classified		Withdrawn	Classified
Coal	27,277,025	33,051,659	Helium	13,578	----------
Oil and gas	5,155,015	71,884	Metalliferous	8,507	----------
Oil shale	6,238,422	4,061,997			
Phosphate	1,889,456	302,219	Total	49,993,909	37,487,759
Potash	9,411,906	----------			

The helium (Utah) and metalliferous (East Bisbee, Ariz.) withdrawals are closed to all location and entry. There are 77,730 acres of naval oil reserves, 156,024 acres of naval oil-shale reserves, and 960,346 acres of defined geologic structures of producing oil and gas fields, all gross areas before deducting the private lands.

The acreage patented during the year under agricultural laws with mineral reservation is shown in the patent table. The total acreage so patented to June 30, 1934, is 25,053,209 acres under the Stock Raising Homestead Act, 10,752,105 acres with coal reservation, and 2,022,916 acres with all or some specific minerals reserved, a total of 37,828,203 acres. Sixty-four percent of the acreage patented in the past 10 years has been with mineral reservation.

DISPOSITION OF PUBLIC DOMAIN

The disposition of the public domain in the United States proper under more than 5,000 acts of Congress has been extremely complex, but the following table pictures the situation in its simplest form:

	Acres
Title passed from the United States:	
Homesteads (approximate)	275,125,000
Cash sales and miscellaneous disposals (approximate)	418,100,000
Railroad grants to corporations	94,219,087
Railroad grants to States	38,206,487
Wagon road grants to States	3,359,188
Canal and river improvement grants to States	6,842,921
Swamp, educational, and other grants to States	181,679,623
Total area disposed of	1,017,532,306
Pending and unperfected public land entries	24,040,779
Title remaining in the United States:	
National forests	138,120,193
National parks and monuments	8,692,196
Indian reservations (estimated net)	56,676,535
Military, naval, and similar reservations, etc. (approximately)	1,000,000
Withdrawals (estimated net)	30,442,832
Unappropriated and unreserved land	165,695,479
Grand total	1,442,220,320

Homestead entries, fiscal year of 1934, includes Indian lands

State	Original		Final		State	Original		Final	
	Number	Acres	Number	Acres		Number	Acres	Number	Acres
Alaska	50	5,755	54	2,953	Oregon	575	118,938	195	43,789
Arizona	423	145,471	422	128,484	South Dakota	154	54,988	92	18,805
California	648	132,908	452	100,884	Utah	188	83,974	108	45,058
Colorado	693	254,349	184	59,237	Washington	97	13,968	24	4,469
Idaho	366	148,069	135	38,523	Wyoming	1,529	794,275	756	338,107
Montana	690	275,501	622	153,116	G.L.O[1]	485	34,898	246	21,679
Nevada	49	13,329	34	8,421					
New Mexico	1,688	767,485	491	196,432	Total	7,741	2,862,142	3,848	1,164,871
North Dakota	106	18,234	33	4,914					

[1] Entries made in General Land Office for land in States without district land offices. The original entries were 235 in Arkansas, 18,760 acres; 57 in Oklahoma, 4,819 acres; 53 in Alabama, 2,975 acres; 30 in Louisiana, 1,795 acres; 25 in Mississippi, 1,516 acres; 24 in Minnesota, 1,296 acres; 13 in Nebraska, 1,044 acres; 15 in Florida, 975 acres; 11 in Kansas, 771 acres; 12 in Michigan, 654 acres; 6 in Wisconsin, 203 acres; 2 in Missouri, 80 acres; and 2 in Indiana, 10 acres.

The above 7,741 original entries include in addition to the three main homestead acts, 38 forest, 2,931 acres; 85 reclamation, 9,690 acres, and 5 Kinkaid homesteads, 384 acres. The final entries likewise include 53 forest, 5,539 acres; 203 reclamation, 18,690 acres; 12 Kinkaid, 1,210 acres; and 38 soldiers' additional homesteads, 671 acres. The finals include 76 commuted entries, 5,675 acres.

Desert land entries, fiscal year of 1934, includes Indian land

State	Original		Final		State	Original		Final	
	Number	Acres	Number	Acres		Number	Acres	Number	Acres
Arizona	8	720	9	1,001	Oregon	13	1,100	5	382
California	12	1,542	11	1,843	Utah	8	748	7	760
Colorado	3	103	6	774	Washington	1	40	1	11
Idaho	4	165	4	234	Wyoming	12	1,786	7	644
Montana	1	36	7	766					
Nevada	3	138	3	284	Total	66	6,456	60	6,699
New Mexico	1	78	-------	-------					

The above final entries include under relief acts 2 entries, 480 acres under act of March 4, 1915; 11 entries, 1,748 acres under act of March 4, 1929; and 1 entry, 160 acres under act of February 14, 1934.

Other entries, fiscal year of 1934, Indian land included

State	Public auction, final		Timber and stone, final		Mineral, final		Miscellaneous			
							Original		Final	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Alaska	-------	-------	-------	-------	10	2,357	1	160	12	93
Arizona	3	415	-------	-------	5	479	[1] 31	6,868	17	145
California	8	440	5	233	23	1,082	10	334	10	80
Colorado	12	772	-------	-------	8	310	[2] 1	1,285	6	800
Idaho	5	292	2	68	8	947	2	-------	25	-------
Montana	7	476	-------	-------	4	103	7	86	40	38
Nevada	2	200	-------	-------	2	306	1	160	2	-------
New Mexico	5	599	-------	-------	2	44	3	480	[3] 1,236	20,103
North Dakota	-------	-------	-------	-------	-------	-------	-------	-------	1	-------
Oregon	13	848	1	40	-------	-------	-------	-------	77	-------
South Dakota	2	160	-------	-------	-------	-------	-------	-------	11	513
Utah	1	20	-------	-------	17	917	-------	-------	[4] 25	12,954
Washington	4	204	3	85	1	20	17	-------	11	59
Wyoming	31	3,390	8	836	1	440	[5] 6	1,077	3	303
General Land Office	4	47	5	311	-------	-------	-------	-------	[6] 34	1,933
Total	97	7,863	24	1,573	81	7,005	79	10,450	1,510	37,021

[1] Consists of 1 entry of cactus land for State, 2,877 acres, and 30 lieu selections, 3,991 acres.
[2] Carey Act segregation.
[3] Includes 1,211 private claims, 19,740 acres.
[4] Includes 21 potassium entries, act of Oct. 2, 1917, 12,845 acres.
[5] Includes 957 acre, Corey Act segregation.
[6] Consists of 20 color-of-title entries, 560 acres, and 14 cash sales, 1,373 acres.

Town lot entries have no acreage shown.

Patents issued during fiscal year ended June 30, 1934

Class	Number	Acres	Class	Number	Acres
Cemetery site	2	30.00	Railroad lieu	4	578.00
Commuted homestead	17	1,667.55	Reclamation homestead	283	23,223.85
Desert land	61	7,413.77	Reclamation desert land	1	153.46
Forest exchange	16	3,474.45	Reissue	527	(3)
Forest homestead	71	7,264.13	Small holding claim	4	206.95
Forest lieu	3	200.00	Soldiers' additional homestead	20	419.13
Homestead, sec. 2289, etc	[1] 710	74,550.80	Special acts	837	172,751.82
Homestead, enlarged	323	82,589.26	Supplemental, act Apr. 14, 1914	115	(4)
Homestead, stock raising	1,507	726,859.05	Swamp	20	28,231.11
Indian fee	253	(2)	Timber and stone	20	1,429.82
Indian homestead, reservation trust	113	18,134.07	Timber sales	64	(5)
Indian trust	90	6,375.15	To complete records	38	(6)
Military land warrant	2	280.00	Town lots	109	68.10
Mineral	110	22,021.37	Valentine scrip	1	40.00
Miscellaneous cash	21	3,039.34			
Public sale	122	9,970.01			
Private land claim	34	33,572.47	Total	5,516	1,288,532.26
Railroad	18	63,988.60			

[1] Includes 7 Kinkaid Act patents, 680 acres. [2] 36,047.41 acres. [3] 75,565.91 acres.
[4] 18,178.72 acres. [5] 4,836.71 acres. [6] No area to be reported.

Area patented with coal reserved, 9,451.23 acres; with oil, gas, phosphate, etc., reserved, 21,363.58 acres; with all minerals reserved, all of stock-raising homesteads and 18,748.41 acres under other acts.

The "special acts" above include 133,550 acres of exchanges to consolidate Indian reservations and allotments, 17,556 acres for quieting titles in Indian pueblos and 3,833 acres of exchanges for consolidating a national monument, all in New Mexico; 2,071 acres for consolidating Indian reservations in Arizona; 6,726 acres for benefit of bona fide claimants on an adjusted railroad grant in Colorado; and 5,570 acres for consolidating national forests.

Applications filed under mineral leasing act of Feb. 25, 1920

State	Filed in 1934	Total to June 30, 1934	State	Filed in 1934	Total to June 30, 1934	State	Filed in 1934	Total to June 30, 1934
Alabama	-------	16	Louisiana	-------	262	Oregon	46	400
Alaska	42	1,729	Michigan	-------	3	South Dakota	28	371
Arizona	18	1,898	Mississippi	-------	15	Utah	335	13,022
Arkansas	-------	24	Montana	199	13,025	Washington	12	271
California	358	21,645	Nebraska	-------	36	Wyoming	241	17,380
Colorado	204	8,966	Nevada	44	1,745	General Land Office	43	109
Florida	-------	1	New Mexico	433	11,109			
Idaho	12	1,053	North Dakota	20	474			
Kansas	-------	5	Oklahoma	-------	557	Total	2,035	94,116

The above includes 57,389 applications accepted for oil and gas prospecting permits.

Vacant public land and pending entries—acres of June 30, 1934, Alaska not included

State	Vacant land	Pending entries	State	Vacant land	Pending entries
Arizona	13,078,560	2,700,000	Oregon	12,919,345	1,168,543
California	15,795,069	1,416,715	South Dakota	463,420	574,320
Colorado	7,552,197	1,893,325	Utah	22,532,110	1,112,567
Idaho	10,069,092	1,457,617	Washington	692,751	182,434
Montana	5,878,931	2,186,524	Wyoming	13,813,200	4,829,821
Nevada	50,975,749	941,130	General Land Office	(1)	[2] 147,972
New Mexico	11,783,265	5,338,753			
North Dakota	141,790	91,058	Total	165,695,479	24,040,779

[1] Undetermined. [2] Entries made at Washington in areas without district offices.

At last determination on June 30, 1932, there was unappropriated and unreserved 175,924 acres in Arkansas, 32,303 in Florida, 269,451 in Minnesota, and 20,225 in Nebraska. Very small areas exist in some of the other States.

National forests and parks and monuments—net areas in public-land States on June 30, 1934

State	Forests	Parks and monuments	State	Forests	Parks and monuments
Alabama	135,248		Nevada	4,985,104	593
Arizona	11,388,053	1,099,793	New Mexico	8,544,053	179,127
Arkansas	1,296,305	946	North Dakota		253
California	19,175,640	2,888,117	Oklahoma	122,268	848
Colorado	13,543,050	366,219	Oregon	13,434,222	158,867
Florida	594,907	19	South Dakota	1,072,095	13,419
Idaho	19,620,454	48,342	Utah	7,523,763	142,102
Illinois	10,710		Washington	9,607,280	539,299
Louisiana	78,395		Wisconsin	328,094	
Michigan	649,781		Wyoming	8,481,264	2,286,506
Minnesota	1,195,645				
Montana	16,127,836	965,820	Total	138,120,193	8,692,196
Nebraska	206,026	1,926	Alaska	21,342,300	5,801,509

State grants—Land patented or certified in fiscal year of 1934 exclusive of 96.39 acres of State railroad grants

[All areas are appropriately included in other tables]

State	Swamp land patents	School section indemnity certifications	Quantity grant certifications	State	Swamp land patents	School section indemnity certifications	Quantity grant certifications
Arizona		41,116	2,319	New Mexico		12,085	24,928
California		1,229	80	Oregon	21,431		
Colorado		154		Oklahoma			640
Florida	1,132			South Dakota		229	
Idaho		120		Utah		10,537	120
Iowa	5			Washington		482	
Louisiana	1,899	84		Wisconsin	285		
Minnesota	485			Wyoming		240	
Missouri	2,994						
Montana		12,557		Total	28,231	78,833	28,087

Railroad grants—Land approved in fiscal year of 1934 for patent or certification

[These areas are included in the tables on total grants to States and corporations]

	State	Acres
TO CORPORATIONS		
Atlantic & Pacific (now Santa Fe Pacific)	Arizona	39,798.86
Central Pacific (California & Oregon)	California	254.47
Central Pacific	do	14,418.80
Do	Nevada	7,229.87
Do	Utah	475.67
Northern Pacific	Montana	9.85
Southern Pacific (main line)	California	1,387.00
Total		63,574.52
TO STATES (STATE GRANTS FOR RAILROADS)		
St. Paul, Minnesota & Manitoba (Great Northern)	Montana	40.00
St. Paul & Northern Pacific	Minnesota	56.39
Total		96.39

State grants—Patented, certified, and school sections to June 30, 1934

State	Swamp, educational, etc.	For canal and river improvement	For wagon roads	For railroads	State total
Alabama	2,258,264	400,016		3,147,148	5,805,428
Arkansas	9,372,993			2,562,610	11,935,603
Florida	21,980,500			2,218,705	24,199,205
Illinois	3,639,281	324,283		2,595,133	6,558,697
Indiana	4,306,254	1,746,224	170,580		6,223,058
Iowa	3,019,690	1,161,514		4,929,923	9,111,127
Kansas	3,606,910			4,634,237	8,241,147
Louisiana	11,032,946			373,057	11,406,003
Michigan	8,787,573	1,250,236	221,013	3,134,058	13,392,880
Minnesota	8,373,947			8,046,061	16,420,008
Mississippi	5,020,774			1,075,345	6,096,119
Missouri	5,578,934			1,837,968	7,416,902
Ohio	2,493,006	1,077,294	80,774		3,651,074
Oregon	4,374,976		2,583,890		6,958,866
Wisconsin	6,220,994	883,354	302,931	3,652,242	11,059,521
		6,842,921	3,359,188	38,206,487	

State	Swamp, educational, etc.	State	Swamp, educational, etc.	State	Swamp, educational, etc.
Arizona	10,542,113	Nebraska	3,458,711	South Dakota	3,434,203
California	8,426,764	Nevada	2,723,647	Tennessee	300,000
Colorado	4,433,538	New Hampshire	150,000	Texas	180,000
Connecticut	180,000	New Jersey	210,000	Utah	7,464,276
Delaware	90,000	New Mexico	12,732,694	Vermont	150,000
Georgia	270,000	New York	990,000	Virginia	300,000
Idaho	3,632,157	North Carolina	270,000	Washington	3,044,471
Kentucky	352,509	North Dakota	3,163,551	West Virginia	150,000
Maine	210,000	Oklahoma	3,095,760	Wyoming	4,138,569
Maryland	210,000	Pennsylvania	780,000		
Massachusetts	360,000	Rhode Island	120,000	Grand total	[1] 181,679,623
Montana	5,869,618	South Carolina	180,000		

[1] This is made up of 64,853,922 acres of swamp and overflowed land, 7,830,000 acres of agricultural college scrip, 78,179,739 acres of school sections, and 30,815,962 acres of grants for schools, colleges, public institutions, improvements, etc.

There is reserved for Alaska sections 16, 36, and certain sections 33 and a quantity grant of 100,000 acres for colleges, an estimated total of 21,445,209 acres.

Railroad grants to corporations—Total land patented or certified to June 30, 1934

	Acres
Central Pacific	7,486,438.83
Central Pacific (Western Pacific)	462,130.18
Central Pacific (California & Oregon)	3,236,741.56
Union Pacific	11,935,603.05
Union Pacific (central branch)	223,141.91
Union Pacific (Kansas division)	6,176,383.76
Union Pacific (Denver Pacific)	821,330.78
Santa Fe Pacific (Atlantic & Pacific)	11,586,049.92
Burlington & Missouri River in Nebraska	2,374,090.77
Sioux City & Pacific (Missouri Valley Land Co.)	42,610.95
Northern Pacific	39,064,567.49
Oregon Central	128,618.13
Oregon & California	2,777,631.96
New Orleans Pacific	1,001,943.40
Southern Pacific (main line)	4,656,398.32
Southern Pacific (branch line)	2,245,405.75
Total	94,219,086.75

Unsurveyed land in public-land States, acres on June 30, 1934

Arizona	28,226,683	Nevada	22,654,148	Washington	6,361,972
California	16,359,414	New Mexico	11,954,969	Wyoming	3,132,800
Colorado	1,903,960	Oregon	5,311,608		
Idaho	12,416,539	South Dakota	32,445	Total	133,562,439
Montana	11,326,574	Utah	13,881,327		

OFFICE OF INDIAN AFFAIRS

(JOHN COLLIER, Commissioner)

The fiscal year 1934 has seen a reorientation of Indian Service policies, and many reorganizations completed or set under way. It has been a year of intense labor, because numerous emergency tasks (some of them of dominating importance to the Indians) have been thrown upon an overhead personnel which previously had been considered a meager one for the regular work alone. On the whole, the staff has met its challenge, and the response of the Indians has gone beyond anything previously hoped for.

A brief outline of the report follows:

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THE WHEELER-HOWARD ACT

In the last paragraph of the Commissioner's annual report for 1933 it was stated:

> If we can relieve the Indian of the unrealistic and fatal allotment system, if we can provide him with land and the means to work the land; if, through group organization and tribal incorporation, we can give him a real share in the management of his own affairs, he can develop normally in his own natural environment. The Indian problem as it exists today, including the heaviest and most unproductive administration costs of public service, has largely grown out of the allotment system which has destroyed the economic integrity of the Indian estate and deprived the Indians of normal economic and human activity.

The allotment system with its train of evil consequences was definitely abandoned as the backbone of the national Indian policy when Congress adopted and the President approved the Wheeler-Howard bill. The first section of this act in effect repeals the General Allotment Act of 1887. During numerous committee

hearings, during several redrafts and modifications affecting every other part of the measure, this first section was never questioned or revised. It reached the President's desk in its original form without the change of a word or a comma, indicating that Congress was thoroughly convinced of the allotment system's complete failure and was eager to abandon it as the governing policy.

THE ACT'S TWOFOLD AIM

The Wheeler-Howard Act, the most important piece of Indian legislation since the eighties, not only ends the long, painful, futile effort to speed up the normal rate of Indian assimilation by individualizing tribal land and other capital assets, but it also endeavors to provide the means, statutory and financial, to repair as far as possible, the incalculable damage done by the allotment policy and its corollaries. Unfortunately, the beginning of the repair work had to be in large part postponed because the authorized appropriations could not be made by Congress after the passage of the act during the closing days of the session.

The repair work authorized by Congress under the terms of the act aims at both the economic and the spiritual rehabilitation of the Indian race. Congress and the President recognized that the cumulative loss of land brought about by the allotment system, a loss reaching 90,000,000 acres—two-thirds of the land heritage of the Indian race in 1887—had robbed the Indians in large part of the necessary basis for self-support. They clearly saw that this loss and the companion effort to break up all Indian tribal relations had condemned large numbers of Indians to become chronic recipients of charity; that the system of leasing individualized holdings had created many thousands of petty landlords unfitted to support themselves when their rental income vanished; that a major proportion of the red race was, therefore, ruined economically and pauperized spiritually.

ECONOMIC REHABILITATION—LAND PURCHASES

To meet this situation, the act authorized a maximum annual appropriation of $2,000,000 for the purchase of land for landless Indians. This maximum appropriation, even if continued over a term of years, will meet only the most pressing emergency-land needs of the Indians. It must be remembered that since 1887 the Indian race has lost the use of 90,000,000 acres, the cream of its land holding. With an annual appropriation of $2,000,000 and an average base price of $20 per acre, it would require 20 years to restore 2,000,000 acres for Indian use.

While Congress did not specifically direct the consolidation of Indian lands broken up and checkerboarded with white holdings in the allotment process, it authorized such consolidation and set up the machinery for it. Congress also authorized the establishment of new reservations for now completely landless and homeless Indians and directed that title to all newly purchased land should be taken in the name of the United States in trust for the Indian tribe or individual Indian, who will have the use and occupancy of the land. Thus the policy of common ownership of land enunciated in section 1 of the Wheeler-Howard Act is reaffirmed and implemented throughout the body of the statute.

Part of the effort at economic rehabilitation is the indefinite extension of all restrictions on the alienation of Indian trust lands as prescribed by section 2. However, this section merely locks the door out of which passed the valuable team of work horses, leaving the decrepit plug behind.

THE REVOLVING CREDIT-FUND

The sponsors of the General Allotment Act of 1887 believed that the division of the tribal land among the members of the tribe would create in the Indian the pride of individual ownership and induce him to make use of his own land for the support of his family. Overlooked entirely was the cold fact that capital in some form is needed to transform even a piece of the best raw land into a productive farm. Since the Indian's newly acquired private land could not legally be pledged as security for bank or private loans, it was the duty of the Federal Government to place at the disposal of its wards, credit in sufficient volume to meet their need for operating capital.

This imperative duty the Federal Government never recognized. Instead, it chose the easier road. It rapidly relaxed its restrictions on leasing. Lacking equipment for farming, the average Indian family proceeded to lease its land to white farmers or stockmen for cash. The leasing system, demoralizing to the Indians and contributing to the surplus of commercial farm products, spread like the Russian thistle. To this day the Indians who rely on the shrinking volume of lease money for their main support far outnumber those who farm their own allotted land.

What was true 50 years ago is true today. Without a reasonable amount of capital for permanent improvements, livestock, seed, implements, etc., the Indian owner of a piece of land cannot hope to make his living from the cultivation of the soil. To meet this pressing need, the Wheeler-Howard Act authorizes a revolving credit fund of $10,000,000.

This fund is to supply the long-term and short-term credit requirements of some 250,000 persons. Much of it must be tied up in long-

term loans for sawmills, homes, and other improvements. Yet there is a huge demand for short-term loans to finance seasonal farm operations. The new lands to be bought for landless Indians must be improved and fenced, homes must be built, implements and seed acquired for the settlers, almost solely out of the revolving credit fund. In all probability the demands of the forthcoming year will demonstrate that it is inadequate.

THE HEIRSHIP-LAND PROBLEM

In the natural course of events, privately owned Indian lands must on the death of the owner be divided among his heirs and, in turn, among the heirs of the heirs. This result of the allotment system brings about the forced sale of Indian heirship lands, usually to white buyers. If there are no buyers, the heirship land must be leased and the proceeds distributed among the numerous heirs at an expense out of all proportion to the size of the gross revenue.

The Wheeler-Howard Act is taking the first hesitant step toward the solution of this problem. The new law, while allowing Indian owners to leave or devise their restricted land to any member of the tribe or to their heirs regardless of tribal affiliations in accordance with applicable State or Federal laws, bars the owners or heirs from selling restricted Indian lands to anyone except the tribe or the tribal corporation in the jurisdiction of which the land is located.

Obviously this negative provision, inapplicable in Oklahoma and on the Klamath Reservation, does not solve the problem. Some 7,000,000 acres are now in the heirship status; the acreage is increasing every month. The tribes have not the money with which to purchase this land. At only $5 per acre, it would require $35,000,000 to reacquire this land; the maximum authorized appropriation for 17½ years would be needed to return the land now in the heirship status for tribal use.

If the problem is to be solved within a reasonable time, the cooperation of the allottees and heirs must be had. They must learn that for the sake of their race and of their children they should voluntarily transfer the title to their individual holdings to the tribe or to the tribal corporation, receiving in return the same rights as they enjoy now; namely, the right to use and occupy the land and its improvements, to receive the income from the land and to leave the same rights to their children, except that the children and other heirs could not cut up the land into small, unusable pieces.

Where the land in process of inheritance has already been so divided among numerous heirs, they will have the opportunity to return the small parcels to the tribe or tribal corporation, receiving interests in the corporate property in exchange. Thus the tribe would acquire

title to now unusable land which, after consolidation, could be assigned for the use of interest-holders in tracts of usable size.

SPIRITUAL REHABILITATION

Through 50 years of "individualization", coupled with an ever-increasing amount of arbitrary supervision over the affairs of individuals and tribes so long as these individuals and tribes had any assets left, the Indians have been robbed of initiative, their spirit has been broken, their health undermined, and their native pride ground into the dust. The efforts at economic rehabilitation cannot and will not be more than partially successful unless they are accompanied by a determined simultaneous effort to rebuild the shattered morale of a subjugated people that has been taught to believe in its racial inferiority.

The Wheeler-Howard Act provides the means of destroying this inferiority complex, through those features which authorize and legalize tribal organization and incorporation, which give these tribal organizations and corporations limited but real power, and authority over their own affairs, which broaden the educational opportunities for Indians, and which give Indians a better chance to enter the Indian Service.

Even before the passage of the Wheeler-Howard bill a great spiritual stirring had become noticeable throughout the Indian country. That awakening of the racial spirit must be sustained, if the rehabilitation of the Indian people is to be successfully carried through. It is necessary to face the fact that pauperization, as the result of a century of spoliation, suppression, and paternalism, has made deep inroads. Of necessity it will take time, patience, and intelligent, sympathetic help to rebuild the Indian character where it has been broken down.

The first step in this rebuilding process must be the reorganization of the tribes, authorized by the Wheeler-Howard Act. In the past they managed their own affairs effectively whenever there was no white interference for selfish ends. They can learn to do it again under present conditions with the aid of modern organization methods, once they realize that these organizations will be permanent and will not be subject to the whims of changing administrations. These organizations, both tribal and corporate, will make many initial mistakes; there will be many complaints against shouldering the load of responsibility that accompanies authority. The task of organizing and incorporating the tribes will be difficult and laborious, calling for the maximum amount of skill, tact, firmness, and understanding on the part of the organizers. But the result should be the development of Indian leadership capable of making the Indian tribal organizations and corporations function effectively with a minimum of governmental interference.

OKLAHOMA TRIBES PENALIZED

It is to be regretted that the Oklahoma tribes, containing almost one-third of the Indians of the United States, should have been excluded by Congress from many of the important provisions of the Wheeler-Howard Act. Through this exclusion the Oklahoma Indians lose the benefit of section 2, which automatically extends the protective trust period on all restricted land; no new reservations can be established in Oklahoma; Oklahoma tribes cannot organize under the new act, nor can they form tribal corporations. Because they are denied the incorporation privilege, they cannot receive loans from the revolving credit fund, which loans can be made only to tribal corporations. It is hoped that Congress will amend the act so as extend all of the benefits of the legislation to all Oklahoma Indians.

LAW AND ORDER

The entire title creating a special court of Indian affairs was omitted and consideration of this subject adjourned until the next Congress. In view of the chaotic state of Indian law enforcement, it is important that this subject be given adequate consideration and that early remedial action be had.

INDIAN CLAIMS

Section 15 of the Wheeler-Howard Act declares that nothing in the statute shall prejudice or impair any Indian claim or suit against the United States. But this declaration does not cure the situation created by the snail-like pace of the hundreds of suits and claims by Indians against the Government. While these suits and claims remain unsettled, they will be used by designing white persons to prejudice the Indian mind against the Government, to raise false hopes of recovering fabulous sums, and by these hopes to make more difficult the task of getting the Indians to face reality and to strive in earnest to help themselves. It is hoped that the next Congress will enact legislation designed finally to settle all Indian claims in the shortest possible time.

DEFINITION OF BLOOD STATUS

An important precedent is established in section 19 of the Wheeler-Howard Act, which limits the benefits of the act to persons of Indian blood who are members of a recognized tribe under Federal jurisdiction, to descendants of such members who lived on the reservation on June 1, 1934, and to unaffiliated Indians of one-half or more Indian blood. This is the first time that the half-blood rule, effective in Canada for many years, has been even partially applied in the United States.

PROBABLE RESULTS OF THE ACT

While the Wheeler-Howard Act marks a decisive shift of direction of American Indian policy, and endeavors to give the Indians not only a broad measure of economic assistance but also those "natural rights of man" mentioned by President Roosevelt in his letter of endorsement sent to the Congress, it stops far short of the ultimate goal. It is merely a beginning in the process of liberating and rejuvenating a subjugated and exploited race living in the midst of an aggressive civilization far ahead, materially speaking, of its own. Even that beginning is oppressively difficult. To carry out the intentions of the act, to realize its potentialities even in part, and to translate them into effective action, will require the active cooperation of the Indians, the utmost of intelligent and wholly sympathetic effort by the Indian Service personnel, the assistance of many other governmental and State agencies, and continued Executive, congressional, and public support.

EDUCATION

Changes in Indian education in recent years have involved three major tasks: (*a*) Improving existing schools; (*b*) reducing and eliminating Indian boarding schools and transferring Indian children back to their own homes; (*c*) developing day schools that will work with adults as well as children and become real centers for Indian community life.

Strengthening of the local community day school has been the most conspicuous effort of the past year and will become even more important under the operation of the Wheeler-Howard Act.

FROM BOARDING SCHOOLS TO DAY SCHOOLS

The 1933 report described the expediting of the transfer of children away from boarding schools to day schools, as intensified by economy legislation. In comparison with the approximately 22,000 Indian children in attendance at Indian boarding schools at the close of the school year 1932, the total enrollment for 1933–34 in boarding schools was about 17,500, with an average attendance of 15,000; and the number appropriated for by Congress on a boarding basis for the new fiscal year just opening is about 13,000. This decrease of 9,000 in 2 years means that the decline of the boarding school as the dominant factor in the education of Indian children is at last an accomplished fact.

During the year under review, 10 Indian boarding schools were either abolished entirely or changed to community day schools:

The Mount Pleasant School, Mount Pleasant, Mich., was transferred by act of Congress to the State of Michigan, and the Indian children are in public

schools, some under foster-home care. The school at Rapid City, S.Dak., was closed, and most of the children returned to Sioux reservation schools, with a few to other boarding schools. From the school at Hayward, Wis., now closed, the Indian children are being accommodated in local public schools, with the eventual help of additional day school facilities furnished under the Public Works program. Indian children formerly in the Genoa Indian School, Genoa Nebr., have been absorbed in local schools, both Federal and State, in Nebraska and South Dakota. Other boarding schools were closed during the year, including Fort Belknap, Mont., where the children are to be cared for in local public schools; Mescalero, N.Mex., where a complete community program waits upon necessary home rehabilitation; Browning, Mont., where the public school authorities are taking over the total educational enterprise, including partial dormitory residence for some high school pupils not able to come every day from their homes; Red Lake, Minn., where whites and Indians are combining forces in a single large school plant now under construction with Public Works funds; Standing Rock, N.Dak., where additional new construction of day schools is taking care of most of the former boarding pupils; and Tohatchi, N. Mex., where a Navajo boarding school of some two hundred children becomes a community day school of about the same number, with transportation furnished for the children living at a distance.

The reductions made in the enrollments of Indian boarding schools are probably even more significant than actual closing of schools. Gradual dropping of elementary grades, accompanied by strengthening of the upper vocational work for older students, has transformed many of these schools. Sherman Institute, formerly estimated for on a basis of a thousand pupils, now carries 650 students, all in high-school grades. Phoenix (Ariz.) School has gone from 725 to 500 within the year; Haskell, Kans., from 900 to 600; Albuquerque, N.Mex., from 850 to 650; Chilocco, Okla., from 900 to 650.

It is not claimed, of course, that elimination of Indian pupils from boarding schools constitutes necessarily any valuable change in itself, nor that this change has been accomplished without some losses. It was, however, an essential first step that had to be taken before reconstruction of the Indian educational program in terms of basic Indian needs could go forward. Some of our Indian boarding schools undoubtedly have a place in the final plan. Some are already doing much to justify their existence by providing specialized training, and may eventually have to be better supported financially in order to do this type of work with a student body of reasonable size. There will be need for a certain amount of institutional care, apart from specialized vocational and leadership training, but it is believed that the need for this institutional care can be greatly reduced by the use of foster-home placement under adequate supervision, and our staff of school social workers is working with this possibility definitely in view.

THE NEW DAY SCHOOLS

One of the reasons why the Indian boarding school persisted in the past as the chief form of Indian education was the gross neglect of day-school possibilities. As with American rural education generally, it was customary in the Indian Service for teachers who succeeded to be "promoted" to the boarding school, and the day schools were likely to find themselves with the poorest possible teachers and other workers. In the new day-school program it is assumed that the best resources we have in personnel, equipment, and teaching materials and methods are to be at the disposal of those in charge.

In the directions given to the architects planning the day schools made possible by the Public Works allotment this year, an attempt is made to state what it is hoped these new day schools will be:

1. The schools are to be community schools of the activity type, for the use of all members of the community, adults as well as children, and the buildings should be adapted to local needs rather than conform to any conventional school plans. The simplest possible construction should be used, with local materials and Indian labor, not only for the usual reasons inherent in the Public Works program, but as part of the Indian participation in school and community work.

2. Even the smallest schools are to have a varied program. They are to be "one-teacher" rather than one-room schools—that is, there should be, in addition to the main "classroom", space for workshop, library school lunch, washing, (frequently for community washing and laundering as well as for children's use), and other needs that will develop for both pupils and community.

3. In schools larger than one-teacher schools there should be abundant space for shopwork, crafts, science, agriculture, music, home economics, library, play and assembly facilities, and such other school and community activities as are indicated in the detailed set-up for each school. A general community meeting place is to be assumed regardless of the size of the school.

Among the locations in the Indian country where central community schools are being built up are the following:

Pine Ridge, S.Dak., where the Oglala Boarding School is becoming a central school for the Pine Ridge area, with some day pupils, some on a 5-day boarding basis (returning to their homes for week-ends), and others remaining at the school on a more continuous boarding plan; Kyle and Allen, S.Dak., junior community schools from which older students will go to the Pine Ridge Central School; Rosebud, S.Dak., where a process similar to that just indicated for Pine Ridge is beginning to be developed; Cheyenne River, Greenwood, and Fort Thompson, S.Dak.; Turtle Mountain, N.Dak., where one of the first of the larger local community schools is now proving its worth; Lac du Flambeau, Wis.; Cherokee, N.C., where a central school at the agency, with local community schools at Soco, Birdtown, Big Cove, and Snowbird, will provide the school nucleus for what should be a complete tribal enterprise that will take fully into account the unusual economic and social opportunities which exist at this reservation; the Pearl River School, Choctaw Agency, Miss.; the Sacaton Central School, Pima Agency, Ariz.; the Salt River Community High School, center for the Salt River Pimas; Santa Rosa, under the Sells Agency (Papago) in Arizona; Cibicue, Ariz., under the White River Apache Agency; San Carlos, where a large number

of former boarding school pupils are on a day basis and there are real possibilities of organizing community effort; Zuni, N.Mex., where a new central high school will emphasize native arts and crafts; Taos, N.Mex., where one of the most beautiful of the new community school plants is taking shape under the hands of skilled Indian workers; and Fort Apache, Ariz., where a central Apache school is contemplated that will eventually, it is hoped, meet some of the needs of the Apaches for training in forestry, cattle-raising, and fruit-growing.

The Navajo educational program.—Need for a new type of community education is most strikingly illustrated in the Navajo area. The Navajos were the last of the Indian groups to be reached with school facilities; in the year just past not over 5,000 of the 13,000 children of school age were in school. It was long assumed that attendance of children at day schools in the Navajo country was impossible except in one or two places. Study of population movements by Supervisor R. M. Tisinger showed, however, that a plan involving small central schools, with bus and horseback transportation, would make day-school attendance possible for the vast majority of the Navajo children. Public Works funds were accordingly made available for the construction of local community day schools to accommodate some 3,000 Navajo children.

In the meantime, beginning in July 1933, a realization of the economic emergency into which the Navajos had come as the result of overgrazing and of soil erosion had led to a determined effort on the part of the Government directed toward range control, the revival of farming, and the salvaging and rehabilitation of vegetation and of soil. Clearly, any community education program would necessarily have to start from this emergency. Merely to operate conventional, or even somewhat better than conventional, schools would help but little in the face of a swiftly disappearing life and land. The problem was, and is, to operate the new day-school enterprises in direct connection with the economic situation that has to be mastered. The Navajos have been told that schools will be provided; they have also been told that these schools must do more than supply "schooling" for their children; that they are to be for adults as well; that if these community education enterprises are to succeed, they must take an active part in planning and developing them. In some instances it has been necessary to explain to them that in specified areas schools must not be built at all if they will intensify the soil erosion difficulties; again, that a school in a given location will be possible only if the herders will agree to certain safeguards intended to protect the grazing area. Workers in education and in other fields in the Navajo area have searched into the Navajo needs, economic, health, and others, to learn how the new Navajo community schools may meet, more effectively than most schools do, the real needs of the people for whom they are established. The Navajo tribal council and the

local chapters of the Navajos have participated in this work of program making.

It is likely that in many instances these community day-school locations in the Navajo country will coincide with local centers for administration. This fact and all the other factors in the total situation make plain the necessity of a program not confined to school activities as generally understood. Some 15 of the centers will be ready for operation in the fall and winter, and it is hoped that practical experience with these first ventures will help make a program that can be carried out from the central Navajo office and can unite in the educational work and the soil-saving work activities of each community.

FEDERAL-STATE RELATIONS

Passage of the Johnson-O'Malley Act in April 1934 brought to a focal point the activities of the Indian Service in establishing cooperative relations with State and local school authorities for the education of Indian children. Under the Johnson-O'Malley Act it becomes possible to contract with the States for services hitherto contracted for with hundreds and even thousands of local districts. In several States, notably California and Washington, Federal education work for Indians had already been given up, and public school authorities were handling the problem. The five small Indian day schools in the Mission country of California were abandoned last year, and Hoopa Valley had been gradually becoming a State rather than a Federal school. The California legislature had long ago passed an enabling act in anticipation of the Federal legislation. Accordingly a contract was arranged with the State department of public instruction whereby the department undertakes to provide education for Indian children in the public schools and other educational institutions of the State, Federal funds to be disbursed on the recommendation of the State department. Sherman Institute is, for the present at least, excluded from the terms of the contract.

In order to make certain that homogeneous Indian communities like Fort Yuma, in the southernmost part of the State, will not be deprived of their distinctive character and their opportunities under the Wheeler-Howard Act, the following provision was agreed upon and written into the contract:

> [The State of California agrees] to afford special courses to Indian arts and crafts, physical and health education; and, in distinctly Indian communities, to provide an educational program designed to meet the special needs of the Indians, this program to be adopted and carried out, wherever feasible, with the advice of anthropologists acquainted with the particular Indian group and after consultation with recognized representatives of the Indians, to the end that the program shall take adequately into account the Indian community life, shall be based on Indian economic, health, and social needs, and shall encourage Indian participation.

In Washington State no strictly Federal schools for Indian children now exist, all the Indian children being accommodated in regular public schools, and the passage of the Johnson-O'Malley Act will hasten a State-wide arrangement similar to that made in California.

It should be understood that the Indian Service is not planning to turn over extensive and important Indian educational work to the States or their subdivisions except where careful preparations have been made. Most of the hoped-for gains accompanying the change from boarding schools to day schools and public schools eventuate only when adequate replacement arrangements are set up. In Nebraska, for example, where we closed the Genoa Boarding School, the total number of Indian children attending school has increased from 985 to 1,372, but increased attendance has proved to be not the only advantage. At the Winnebago-Omaha Agency, where most of these Indian children are, we have been able to provide social workers to help with the families, and a physical-education man to direct recreational activities; we have helped the local schools to introduce shop work and strengthen home economics—to the manifest advantage of white and Indian children alike—and we have increased the provision for institutional care of children who were in need of such care; all at a cost far below that of the boarding school.

We recognize, of course, that the poorer public schools are likely to be where the Indians are; that these schools have been especially hard-hit by the depression; and that in difficult financial times such schools, even more than schools elsewhere, tend to drop from their program certain of those newer elements—health and physical education, shop work, home economics, art, music—which constitute the real fundamentals. To the extent that we have been able to strengthen our Federal Indian schools in these respects (and we have made real progress here) we are naturally reluctant to turn over Indian children to local public schools unless we can get some assurance that a modern type of education will be provided. On the other hand, if we can, by the method of paying tuition for Indian children, demand and obtain desirable educational activities that would otherwise not be forthcoming, there would seem to be justification for taking the step in the interest of both Indian and white children.

HEALTH EDUCATION

One of the distinct achievements of the year is the establishment of the position of supervisor of health education and the securing of a well-known specialist in this field, Miss Sally Lucas Jean, to organize a health education program under the joint auspices of the divisions of health and education. Through the initiative of this supervisor and the cooperation of the health division, a Navajo nurse-aids institute

was held at the Santa Fe Indian school in June 1934, and of the 98 Navajo young women who attended, 25 were declared eligible for appointment as nurse-aids in the new Navajo day school centers. A specialist on health curriculum was also retained for temporary service in assisting members of the education staff of the Service in preparing materials for Indian schools on health.

INDIAN RELIGION, MISSIONS, AND THE SCHOOLS

For many years, anthropologists and other students of Indian affairs have been distressed at a strong tendency in the Indian schools to impress upon Indian children that Indian customs, Indian language, and Indian ways of living were necessarily bad and must be completely uprooted as part of the educational process. In an effort to counteract this tendency and set up standards of appreciation of the worthwhile things in Indian life, Circular 2970 was issued in January 1934. Calling attention to the fact that some Indian Service officials and employees, some missionaries, and many Indians are unsympathetic to Indian religious expressions, ceremonial and art expression of Indians, and the use of Indian native languages, the Commissioner's circular says:

> There are Government schools into which no trace of Indian symbolism or art or craft expression has been permitted to enter. There are large numbers of Indians who believe that their native religious life and Indian culture are frowned upon by the Government, if not actually banned.
>
> Accordingly—
>
> No interference with Indian religious life or expression will hereafter be tolerated. The cultural history of Indians is in all respects to be considered equal to that of any non-Indian group. And it is desirable that Indians be bilingual—fluent and literate in the English language, and fluent in their vital, beautiful, and efficient native languages * * *. The Indian arts are to be prized, nourished, and honored.

Religious instruction.—Appreciation of Indian culture does not mean that there is any intention of interfering unduly with intelligent and devoted mission effort on the part of Catholic or Protestant workers in the Indian field. It is felt that there is a valuable service to be rendered by the missions, especially in providing institutional care for certain types of underprivileged children. The school regulations covering "religious worship and instruction" were amended in January 1934 in such a way as to permit the use of boarding school premises for religious instruction, but at the same time to require specific direction from the parent and to forbid compulsion in the case of any child. As to day schools, the new regulations provide that children shall be excused for religious instruction for 1 hour a week upon the request of the parents, and that "while religious exercises are not to be held in the premises of day schools during regular

school hours," facilities at the day school may be provided "for the use of religious instructors at times and under conditions not in conflict with the uses of the building by the Indian Service or the community."

TRAINING OPPORTUNITIES AND INDIAN EMPLOYMENT

The educational loan provisions of the Wheeler-Howard Act give special point to what has so far been done in the advanced vocational and technical training of Indian youth for positions in the Indian Service and elsewhere. In 1933–34 there were 515 Indian students enrolled in colleges and universities throughout the United States, of whom 168 were assisted by Federal or tribal funds and 17 were on private scholarships secured through the efforts of the Indian Office. Among the professional and advanced vocational courses represented were: Teaching, 49; physical education, 19; home economics, 12; nursing, 11; agriculture, 8; art, 5; music, 5; medicine, 5; civil engineering, 5; law, 5; forestry, 3; electrical engineering, 3; architecture, 3; social service, 3.

Surveys have been carried on during the past year in Washington, Oregon, Montana, Idaho, and northern California, to provide authentic information on which to determine the need and kinds of vocational training for Indian youth of the Northwest.

Placement and guidance work for girls and women has continued in operation at Los Angeles, Phoenix, Kansas City, and Tucson. In Oakland, Calif., a cooperative arrangement has been worked out with the Young Women's Christian Association.

EDUCATION FOR NATIVES OF ALASKA

The work of education for natives of Alaska, brought over as a separate activity into the Indian Service in 1931, has gradually tended to become part of the total program of Indian education under the Indian Service. In certain of its features, however, it remains distinct. The need for suitable supervision and for in-service training of teachers and workers led this past year to the inauguration of a summer demonstration school for the teachers of northern Alaska and the provision of a supervisor of elementary education for the southeastern area. Schools in isolated Alaska villages necessarily serve as community centers for many of the village activities, and upon the school and the teachers falls the duty of aiding in the solution of many communal and individual problems not always thought of as educational, nor always with a counterpart in regions outside of Alaska.

Needs for the immediate future, as seen by the director of education for natives of Alaska, are a continuation of the effort to evolve an

educational approach integrated with local needs, the establishment of a working relationship between Federal and Territorial schools, increased participation of native village organizations in school matters, extensive building replacements and repairs, additional educational supplies and materials, further supervision and aid in education, social welfare, and economic advancement, and the extension of the educational services into untouched villages, especially in the Yukon-Kuskokwim Delta area and along the coast line east of Point Barrow. The Federal Government is, as yet, a niggardly guardian over the Alaskan Indians.

HEALTH

Tuberculosis, trachoma, and venereal disease continue as the principal Indian health scourges.

Statistics on the tuberculosis rate have never been reliable, but general examinations and surveys indicate that there is at least ten times more tuberculosis among Indians than among whites. Our tuberculosis sanatoria are totally inadequate to cope with the situation and to provide for the removal of open infective cases from the home. A special physician for tuberculosis work was appointed this year. It is only a beginning, but it is believed that the results of his work will justify the employment of many more. It is impossible, due to economy requirements, to provide hospitalization for all those needing it, but it is feasible to teach ordinary public health and preventive measures in the homes.

Trachoma is still prevalent to a grave extent. The treatment of trachoma has been carried on primarily by a small corps of 11 special physicians. More are needed; however, we are emphasizing the teaching of operative procedures and after-treatment technique by these special physicians to the local agency and hospital physicians.

As yet, practically no public health work has been done toward the prevention of venereal disease. It is earnestly hoped that in the near future special physicians can be appointed to work toward the prevention of these diseases. Education in social hygiene, within and without the Indian schools and hospitals, is as yet almost wholly a thing of the future.

INCREASING WORK WITH DECREASING BUDGET

Health personnel in 1932, exclusive of supervisory personnel, some of which is detailed from the Public Health Service, consisted of 217 physicians, 401 hospital, field, and special nurses, 15 dentists, and 643 employees principally engaged in institutional work. The comparable numbers for 1934 are 216, 393, 16, and 644 respectively. Appropriations actually were decreased by $369.650 during this

2-year period, notwithstanding the critical need for this type of service to the Indians. Exclusive of construction, $3,783,000 was provided for 1932, and only $3,413,350 for 1934. These latter amounts include tribal funds and appropriations for the Alaskan medical work.

The increase of work done, and of overwork, is illustrated by the rise in hospital days from 508,050 in 1927 to 1,078,881 in 1933, and by the increase in out-patient treatments at hospitals from 703,141 in 1927 to 1,432,254 in 1933.

COOPERATION FROM PUBLIC HEALTH SERVICE

The Public Health Service has continued the detail of various personnel to the Indian Service. Routine investigations of water supplies, sewage disposal, milk production, and all problems requiring technical advice of the sanitary engineers have been continued as in the past by the detail of sanitary engineers by the Public Health Service.

The Committee on Indian Affairs of the State and Provincial Health Authorities of North America is continuing its active support in developing cooperative relationships in the Indian Field Service at various state and local health agencies.

THE JOHNSON-O'MALLEY ACT AND HEALTH

Public health activities have been stimulated by the Johnson-O'Malley Act, whose provisions are explained in the section on education. Whenever possible, cooperative relationships are being entered into which local health authorities, looking toward the provision of a well-rounded public health program reaching Indians and whites alike. During the year two such agreements have been made. One is with the State of North Carolina, and under its provisions, the State Board of Health, the Public Health Service and the Indian Office have organized a health district comprising the three counties in which the Eastern Cherokee Indians live. This district is now operating as a unit, with good results. In preparation for this agreement, a general health survey of the Cherokee people was carried out during the preceding fiscal year.

The other cooperative agreement is with the State of Florida. Under its terms, one public health nurse has been assigned by the Indian Office to the State Board of Health of Florida for work among the Seminole Indians. This practically is the beginning of health work in behalf of the Seminoles.

NEW HOSPITALS

Public Works grants have been secured to construct eleven new Indian Service hospitals and to make improvements at ten existing

hospitals. In addition, the Albuquerque Tuberculosis Sanatorium was opened for patients about January 1, 1934.

It is encouraging to visualize the functioning of additional hospitals in the Indian Service. However, the supply of hospital beds remains far under the demand, since Indians more and more are taking advantage of hospital facilities. The increase of hospital days, etc., has been previously mentioned.

NURSING SERVICE

During the past fiscal year the Health division continued to be greatly handicapped by the present slow procedure in employing nurses.

Sixty-seven appointments and 71 separations were made. This tremendous turnover, which has been averaging 80 percent, may be compared with the rate of 7 percent in the Army and 11 percent for the Navy. The reason for this disastrous turnover is readily apparent. Comparison of the Indian Service's quota of nurses to patients with that provided by other Government services follows:

	Nurses	Attendants
Veterans' Administration	1 to 8 patients	1 to 6.5 patients.
Public Health Service	1 to 9 patients	1 to 2.3 patients.
Army	1 to 10 patients	1 to 1.7 patients.
Navy	1 to 20 [1] patients	(1)
Indian Service	1 to 14.8 patients	1 to 11 patients.

[1] These are all supervisory nurses, the corpsmen doing the routine ward work.

Indian Service nurses work, on the average, from 58 to 66 hours a week. The work-week of nurses in other services is from 40 to 48 hours.

The results are obvious—long hours, overwork, physical breakdown, making it quite impossible to maintain and operate an efficient nursing service. Through special efforts made during the last session of Congress, a sum was obtained for employing 45 additional nurses. Relief sought for several years has finally been obtained in part. However, the work-week for nursing personnel has not been greatly diminished.

An additional burden to the hospital nurse is the necessity of doing heavy clerical work.

Ninety-three public health nurses in the field are the nucleus for our public-health programs. The success of their work has created a demand for additional public-health nurses.

The supervisory service over this field force is utterly inadequate. It is now possible for the supervisor of nurses to visit each nurse only once every several years. With our new program of public health developing as it is, a more extensive supervisory service must be attempted.

DENTAL SERVICE

Inadequate personnel, the isolation and scattered distribution of the Indian population, and the lack of local facilities for furnishing dental treatment, make it impossible to provide an adequate dental service for more than a small percentage of the Indians. There are 11 whole-time and 14 part-time dentists for all the Indians of the United States and the natives of Alaska.

CRIPPLED CHILDREN

During the fiscal year an attempt was made to learn the number of crippled Indian children. The result is a statistical file in the office of the Health Division, giving the names, ages, and addresses, with a diagnosis, of 770 crippled Indian children. Most of these deformities are due to congenital dislocations of the hip and tuberculosis. Many need immediate treatment. If taken in time many of these conditions, especially the congenital dislocations, can be cured. We deeply hope that steps can be taken to start some sort of remedial work.

PERSONNEL

Dr. M. C. Guthrie, director of health, was relieved by Senior Surgeon J. G. Townsend, United States Public Health Service, on December 28, 1933.

Dr. F. I. Proctor has been appointed as consultant in trachoma, at $1 a year.

Dr. W. W. Peter has been appointed as chief health officer and director of medical activities for the Navajo area.

ALASKA MEDICAL SERVICE

For the 29,983 Indians and Eskimos of Alaska, we have a medical force of a director, 6 full-time physicians, 5 part-time physicians, 1 traveling dentist, 15 hospital nurses, 23 public health village nurses, and 32 minor employees, making a total of 82.

Mention should be made of, and credit given to, the United States Coast Guard, whose officers, physicians and dentists in Alaska have extended their facilities most cordially to the Indian Service and have themselves rendered valuable medical and dental assistance to the natives at villages reached by the Coast Guard vessels.

Tuberculosis continues to be the most prevalent disease among the natives. Facilities for its prevention and care are sadly inadequate. There is urgent immediate need for the construction of hospitals at Ketchikan, Seward, and Bethel, for the replacement of the present inadequate hospital at Kanakanak, and for the addition of a tuberculosis wing to the hospital at Kotzebue. Additional traveling public

health nurses are also needed to instruct the natives in disease prevention, in sanitation, and in child care; to provide follow-up work for discharged hospital cases; and to work for immunization against contagious and infectious diseases.

Concerning whole populations of natives in Alaska, it can be said: A modern health service must be furnished them if they are to survive; only a beginning as yet has been made.

INDIAN LAND

The activities of the land division involve matters of so varied a nature as to preclude describing them in detail in this report. These activities include work in land acquisition, mineral rights and leases, allotments of land in severalty, enrollment of individual Indians, tribal litigation in the Court of Claims, legislation, and hunting and fishing rights.

LAND ACQUISITION

Pursuant to the act of June 14, 1934 (Public No. 352), approximately 1,000,000 acres will be added to the Navajo Indian Reservation in Arizona. This acreage consists of public domain interspersed with privately owned lands. The latter are to be acquired through exchange and purchase as authorized by the act. The passage of this act is another step forward in completing plans formulated 2½ years ago for rounding out the then existing Navajo Reservation. Three steps were involved. The first was the acquisition of the so-called "Paiute Strip", and the second step was the rounding out of the boundary line in Arizona. These two steps have been consummated, and the remaining step, which is to round out the reservation boundary in New Mexico, will no doubt be accomplished within the coming legislative year. A bill for that purpose was introduced during the last session of Congress and was passed in the Senate and was before the House for consideration at the time the last Congress adjourned.

Legislation was obtained, embodied in the act of May 23, 1934 (Public No. 247, 73d Cong.), authorizing the exchange and consolidation of Indian and privately owned lands within the checkerboard area reserved as an addition to the Fort Mojave Reservation by Executive order of February 2, 1911.

Under authority of the act of June 7, 1924 (43 Stat. 636) as amended by the act of May 31, 1933 (48 Stat. 108), the following purchases of land within certain Pueblo reservations in New Mexico have been made during the past year.

Pueblo	Area in acres	Cost
Nambe (4 separate tracts)	33.89	$3,460
Santo Domingo	13.38	1,000

Several purchases for the benefit of other Pueblos are pending.

Pursuant to section 3 of the act of May 31, 1933 (48 Stat. 108), regulations were promulgated September 28, 1933, governing the disbursement of compensation to white settlers or non-Indian claimants within the various pueblos, who were found by the Pueblo Lands Board to have occupied and claimed land in good faith but whose claim to title was not sustained by the board. Payment has been made to practically all of the claimants, except in a few cases where the claimant is deceased and the heirs are undetermined; also in a few cases where the claimant has appealed from the award made by the board. Appropriate action to clear such cases is being taken.

Just before the end of the fiscal year the Indian Office received tentative approval for the purchase of a half million acres of land under the submarginal land-purchase program. A staff was organized and began work in the field before the close of the year.

SUBSISTENCE HOMESTEADS

Late in the fiscal year, the Indian Service received tentative approval from the Subsistence Homestead Division of the Department of the Interior to construct five or six Indian homestead projects under the provisions of section 208 of the National Industrial Recovery Act, approved June 16, 1933. Studies were immediately started and plans developed for procedure on this work.

MINERALS

The last fiscal year marked the extension of the Cut Bank oil field into the eastern side of the Blackfeet Indian Reservation in Montana. This field, now definitely established, is perhaps the largest potential oil-producing area in the world and may yield the Blackfeet Indians a substantial royalty income for a number of years. Under the terms of existing leases a number of additional wells within the boundaries of the Indian reservation in this field are to be drilled during the coming year, in response to insistent demands of the Blackfeet Tribal Council. The oil is a very good grade of light oil of about 40° A.P.I. gravity. Most of the crude oil is marketed in Canada. So far, no dry holes have been drilled in this field. The wells are not large producers, the initial production ranging from about 30 barrels per day to 150 barrels per day. Construction work has been started on a new pipe line from the Cut Bank field to Coutts, Alberta, Canada. The line will be a welded line of about 30 miles in length. One 80,000-barrel tank and two 10,000-barrel tanks are to be erected.

The Maverick Springs field, Shoshone Reservation, Wyo., remained practically dormant during the year. There is a very limited demand for the oil produced from this field, which is a heavy black oil of low gravity, although a very good road oil.

The tribal lease in the Soap Creek oil field, Crow Reservation, Mont., has been assigned and a new well is being drilled further to test this field. This is the first drilling activity in this area since the original discovery wells were completed approximately 12 years ago. The oil from this field is also heavy black oil of low gravity, valuable principally for road-building purposes. A unit plan of operation has been arranged among the several lessees in the Soap Creek field, and it is probable that it may yet prove to be of considerable value to the Indians and the operators as well.

New oil-producing areas of considerable proportions were proved in the Osage Reservation during the year. Considerable increased interest in Osage leases was thereby revived, and the economic status of the Osage Tribe has been materially improved. A plan for operating and developing the areas has been approved by the Petroleum Administrative Board and is being carried out through cooperation with the Oklahoma State Corporation Commission.

The Osage Tribal Council has employed attorneys with the approval of the Department to attempt to recover alleged excessive deductions for impurities in oil made by purchasing companies over and above actual losses sustained by them. The claim, if substantiated, may recover several millions of dollars.

Further repressuring experimentation by the injection of gas into the partially exhausted oil sands was approved during the year and resulted in a considerable increase in production of oil from the Wilcox sand in Oklahoma fields. The result indicates a very favorable outlook, and doubtless pressure restoration to increase recovery will be resorted to in other wells producing from the Wilcox sand.

There are about 1,036 producing leases of restricted allotted Indian lands in Oklahoma, and, including the 9,371 producing tribal Osage wells, there are in the State of Oklahoma a total of 14,188 producing oil and gas wells on restricted Indian lands. Approximately one-half million acres are under lease, besides practically the entire Osage Reservation which is leased for gas-mining purposes.

There are now 33 producing wells on the Navajo Reservation in New Mexico. Over $1,000,000 has been received in royalties since their initial discovery approximately 13 years ago.

Forty-two coal mines were under active operation covering lands under the jurisdiction of the Five Civilized Tribes Agency, and 388,094 tons of coal were mined, producing an income of $49,696.29. Public Works Project No. 63, operating within the area of the Choctaw and Chickasaw segregated coal lands for the purpose of controlling surface and subsurface water, was assigned to the United States Geological Survey engineer in charge of the coal mines in this district The benefits to these coal lands are very gratifying.

During the fiscal year 1934 there was an average of 17 large mine, ore, and tailing mills in operation on restricted Quapaw Indian lands, as compared with 6 such mills during the prior fiscal year. These mills constituted 42 percent of the average number of mills in operation in the tri-State district for the year. The total value of lead and zinc concentrates mined and sold from these lands was $2,568,307.39. The Indians' royalties amounted to $245,842.23. Considerable beneficial work was done in these lead and zinc mining fields, also under Public Works Project No. 63–Q, in the control of surface and subsurface water.

ALLOTMENTS

The policy of this administration has been opposed to the further allotment in severalty of reservation lands. The Wheeler-Howard Act, passed June 18, 1934, (Public, No. 383, 73d Cong.) repealed all existing allotment laws and effectively puts an end to the making of further allotments from existing tribal lands.

During the early part of the fiscal year 1934, due to valid rights previously initiated, a total of 48 individual Indians were allotted 1,421.55 acres of tribal lands as follows:

Reservation	Number of allotments	Acreage
Hoopa Valley, Calif.	40	638.25
White Earth, Minn.	1	160.00
Standing Rock, N.Dak.	1	159.13
Quinaielt	6	464.17
Total	48	1,421.55

In addition, allotments were made to eight individual Indians on the public domain and in national forests, embracing a total of 835.68 acres. The prohibition against further allotments contained in the Wheeler-Howard Act does not apply to Indians living on the public domain or in national forests.

During the past year 25 fee patents, issued during the trust period without application from the individual Indian, have been canceled under authority of the acts of February 26, 1927 (44 Stat. 1247) and February 21, 1931 (46 Stat. 1205), bringing the total number of such cancelations to 401. In addition, several patents have been canceled during the past year by decrees of the Federal courts as the result of suits brought by the Federal Government. In one of these suits, the sum of $986.26 was recovered for the benefit of the allottee, representing taxes paid by her (*United States* v. *Comanche County, Oklahoma*, 6 Fed. Supp. 401). Other suits have been instituted, involving approximately 50 allotments, and 60 additional cases are about ready to be submitted to the Department of Justice for appropriate action.

Interpretation of the Mexican Kickapoo Act of June 21, 1906 (34 Stat. 325–363) finally reached the Supreme Court of the United States, and a decision favorable to the Government was handed down on November 6, 1933, which, it is expected, will be the basis for a number of suits to clear title to Mexican Kickapoo allotments (*United States* v. *F. H. Reily*, 290 U.S. 33).

Steps have been taken to obtain from the field the necessary information as to land values, preparatory to making appropriate recommendation to Congress on account of claims for "Lost allotments" for the Sioux Indians, which have been adjudicated under the act of May 3, 1928 (45 Stat.L., 484). The original plan was to make allotments in such cases where land was available which could be used for the purpose; but in view of the prohibition against allotments embodied in the Wheeler-Howard Act, it will be necessary to obtain appropriations sufficient to cover all claims of this nature.

LITIGATION

Comprehensive reports were submitted to the Department of Justice on six cases in the Court of Claims against the United States: the Nez Perce case, no. K–107; the California case, no. K–344; the Ponca Indians of Oklahoma and Nebraska, no. L–4; the Quinaielt case, no. L–23; the Warm Springs case, no. M–112; and the Northwestern Shoshone case, no. M–167.

Reports were prepared and were pending June 30 on the Pillager Indian case, no. M–387; and the Saginaw, Swan Creek, and Black River case, no. H–211.

Another report, which had been prepared and was pending June 30, was on a tentative stipulation of facts in Chippewa case no. H–192. The report was not signed, however, until July 19, 1934.

A tribal roll of the Uintah, White River, and Uncompahgre Bands of Ute Indians of the Uintah and Ouray Agency, Utah, was approved, for the purpose of paying out about $1,000,000 appropriated for these Indians, under the act of February 13, 1931 (46 Stat.L., 1092), to cover certain claims, in lieu of submitting the claims to the United States Court of Claims for adjudication.

The Five Civilized Tribes have filed in the aggregate 59 suits against the United States in the Court of Claims, in which were set forth the claims of these tribes against the United States aggregating more than $500,000,000. Of these suits, 17 were instituted by the Creek Nation, 11 by the Seminole Nation, 9 by the Cherokee Nation, 1 by the Eastern or Emigrant Cherokee group, 1 by the Old Settler or Western Cherokee group, 3 by the Eastern or Emigrant Cherokee group and Old Settler or Western Cherokee group jointly, 5 by the Choctaw Nation, 5 by the Chickasaw Nation, and 7 by the Choctaw and Chickasaw Nations jointly.

Of the above-mentioned 59 suits, the Court of Claims, prior to this fiscal year, rendered decisions adverse to the Indian nations in 4 cases, and in 2 other cases dismissed the petitions at the request of the plaintiff Indian nations. In two of the cases in which adverse decisions to the Indian nations had been rendered, the court has permitted the cases to be reopened and amended petitions filed. During the present fiscal year the Court of Claims rendered decisions adverse to the Indian nations in two cases but later permitted one of the cases to be reopened and amended petitions filed. Two other cases were dismissed on request of the plaintiff Indian nations. On March 13, 1933, the Court of Claims rendered a decision in favor of the Creek Nation in one case in the net sum of $86,823.19, but the Supreme Court of the United States on April 11, 1934, granted to the United States a writ of certiorari to said court where the case is now pending. On December 4, 1933, the Court of Claims rendered decision in another case in favor of the Creek Indian Nation in the sum of $144,106.01. No further action was taken on behalf of the United States in this case, and an appropriation (act of June 19, 1934, Public, 412, 73d Cong.) was made for payment of the judgment of the court. There are 49 cases now pending in the Court of Claims and one case pending in the Supreme Court of the United States.

The Department of the Interior furnished during the present fiscal year 11 reports to the Attorney General relative to these suits and the matters involved. Prior to the present fiscal year 15 reports were furnished the Attorney General concerning these pending cases and the matters involved. Reports for the information of the Attorney General as to other pending suits and the matters involved are in course of preparation.

PROBATE WORK

This division is made up of 4 professional employees in the Washington office, 16 in the various reservations, and 7 probate attorneys in Oklahoma.

Its function is to probate the estates of all Indians who die leaving trust property. Here the Indian is followed from the cradle to the grave, and in the division of his material wealth all his sins and virtues are exposed to view. At the present moment, estates originating from the Civil War are now being determined, and the legal and social customs of the Indian during all that period enter into each case.

During the past year the heirs have been determined in 2,092 estates; yet the work is never up to date. This division is the clearing house for all inquiries relative to Indian estates. Senators, Congressmen, prospective heirs, beneficiaries under wills, and the general public claim daily attention.

Probate work is done for the Indian at minimum expense, estates valued at less than $250 carrying no fee. The minimum fee is $20, and no fee in excess of $75 may be charged regardless of the value of the estate. Because of the volume of work, these small fees make the division practically self-sustaining.

All decrees and final orders relative to these estates, save those of the Five Civilized Tribes of Oklahoma, must have the approval of the Secretary of the Interior. From his decision there is no appeal. Consequently the work of the experts of this division is most exacting. Careful reviews of each case are made to prevent error, and should one creep in, the Secretary may and does, either on application or of his own motion, remedy the situation.

On July 1, 1934, the entire Probate Division was transferred to the Solicitor of the Secretary's Office, including the seven probate attorneys in Oklahoma. Under the act of January 27, 1933 (Pub., 322, 72d Cong.), these attorneys are restored to jurisdiction over all probate proceedings in their respective districts.

EMERGENCY CONSERVATION WORK

Emergency Conservation Work was set up by the act of March 31, 1933, but since funds were not available until June 20, work did not begin, except on a few reservations, until July 1933. Regulations were liberalized to give to the Indian Service the supervision over this work on Indian reservations, including the disbursement of funds and employment of personnel.

FUNDS

A total of $12,375,200 has been allotted. Of this amount $11,091,872 was allotted to field units. The balance was retained for future allotments, and to supplement the amount made available for the fiscal year 1935.

ENROLLMENT—EMPLOYMENT

Enrollment was open to Indians over 18 years of age able to perform ordinary labor and free from communicable disease.

The maximum number of enrolled men on the pay roll at any one time was about 13,000. For the entire year, July 1933 to June 30, 1934, the average monthly number of enrolled men employed is 9,600. However, through the "staggering" of employment the number of Indians put at work in the months of maximum employment was 20,833. Some of the agencies staggered employment so effectively that it is quite possible that some 25,000 different Indians were on the Indian emergency conservation work pay rolls at one time or another during the year. This would indicate that

approximately 80,000 to 100,000 Indians have benefited from emergency conservation work.

The number of supervisory jobs has been kept under strict control. Indians were given preference from the outset in filling all such jobs; and they have taken over as rapidly as they could be trained. It was necessary in addition to employ technically trained men, such as foresters and engineers. Few Indians could qualify for these positions. However, a large number of group foremen, mechanics, machine operators, camp assistants, assistants, and assistant foremen have been Indians. Regular forestry employees of the Indian Service supervised emergency conservation work for several months. As their own work suffered on this account, it was necessary for us to get qualified men to relieve them, thus enabling the forestry men to return in part to their regular duties.

The following table shows the number of Indians and non-Indians in supervisory and facilitating positions:

	Indians	Non-Indians	Total
November 1933	404	560	964
December	358	462	820
January 1934	366	496	862
February	381	383	764
March	455	385	840
April	523	402	925
May	555	454	1,009
June	604	469	1,073

Under the liberalized plan approved by Director Fechner, Indians were permitted to work from their own camps or from their homes, according to choice. The rate of pay for Indians was the same as that given whites in the C.C.C. camps, a cash allowance of $30 per month, with quarters and food if camps were provided. Indians were even permitted to work on a day basis. Work was limited to 20 days per month, at $1.50 per day, to keep within the cash allowance of $30 per month authorized by the President. Where it was not desirable to establish camps, Director Fechner authorized the Indian Office to pay each Indian, not provided with quarters and subsistence, the commutation allowance of 60 cents per day. Thus, if an Indian was lodged and subsisted by the Government he received $30 per month cash; if he lived at home and subsisted himself, he received $42 per month, or payment at the rate of $2.10 per day for each day worked less than the monthly maximum of 20 days.

The family camp was an interesting development. Indian families moved their tents close to work projects. As they furnished their own quarters and subsisted themselves, they received commutation of quarters and subsistence. This arrangement cost the Government much less than the construction, equipment, and maintenance of camps.

HEALTH—ACCIDENTS

The health of the Indians has been enormously benefited, a natural consequence of healthy outdoor work and good food. At the start, the expense of feeding the Indians was quite high, but we made no effort to check it, realizing that sooner or later the Indian appetite would adjust itself. From many reservations we have had reports that the average weight increase was from 5 to 8 pounds per man, solid flesh and muscle, due to good food and healthful occupation. On the Osage Reservation in Oklahoma an amusing contrast is shown—many of the Indians actually lost weight and benefited by it.

Reports of accidents and illnesses on the various reservations through March 31, 1934, showed only 7 cases of illness and 44 minor accidents. These reports are undoubtedly incomplete, however. But 13 deaths were reported and 4 of these were not work-connected.

PRODUCTION ACCOMPLISHMENTS

The achievements by Indians in this campaign of hard manual work are among the proud exploits of their race. During the fiscal year, Indians in the Indian emergency conservation work completed the following major quantities of new construction at 78 jurisdictions in 22 States—besides heavy maintenance work and an array of miscellaneous items of new construction:

Forestry		*Range improvement*	
Telephone lines	miles 2,060	Check dams (erosion)	units 25,439
Truck or horse trails	do 2,772	Stock water reservoirs	do 1,067
Bridges	units 415	Springs and wells developed	units 1,042
Fire lanes	miles 543	Corrals	do 66
Trailside clearing	do 810	Range and other fences	miles 2,558
Stand improvement or reduction of fire hazards	square miles 15	Driveways for stock	do 166
Insect pest (tree)	do 49	Rodent control	square miles 4,795
Fighting forest fires	man-days 22,169	Elimination of useless range stock	head 46,972

The benefits to the Indians physically and morally have been incalculable. The benefits to the reservations have materially increased the value of the Indian holdings. It is difficult to estimate the actual increase. In some instances it will not be fully measurable until years have passed, but we believe the immediate benefits in money values are greater than the amount of money expended for such improvements.

Tribal authorities have passed upon the projects, wherever tribal organization existed.

DISBURSEMENTS

Of the sums disbursed by the Indian emergency conservation work through March 31, 1934, pay roll (including shelter and subsistence or commutation thereof, and team hire with services) accounted for 72.73 percent; purchases of heavy equipment accounted for 6.12 percent; while purchases of supplies for field work accounted for 11.40 percent. Of the total pay roll, 86.86 percent went to Indian enrolled men or to Indian supervisors and skilled laborers. All but 16.09 percent of the total pay roll went to enrolled men. Purchases of expensive equipment were kept to a minimum consistent with efficient work.

LEADER TRAINING CAMPS

Four leader camps were established—one each at Yakima, Mescalero, Fort Apache, and Western Navajo. Two hundred and twenty-two Indians were enrolled at the 4 camps; 211 finished the course and received final rating. These leader camps appear to be well worth while, and if conditions permit we hope to have at least four more during the coming year.

The Indians earned and learned. Projects were soil erosion, forestation, and kindred subjects.

MISCELLANEOUS

The training of Indians for leadership has been a major objective from the first. The set-up has been arranged so that gradual steps may be taken by Indians. The enrolled man may be promoted to assistant leader at $36; then to leader at $45; to subforeman at $100 gross; to assistant foreman at $135 gross; to group foreman, maximum $167 gross. Project managerships are also available. There were about 1,560 assistant leaders and leaders on June 30, 1934.

Wages of Indians have been saved by withholding, in many instances, part of the earnings. Approximately $500,000 was withheld up to March 31, 1934. This reserve will prove invaluable to the Indians later on.

Director Fechner has given sympathetic consideration to every request made by us and has cordially cooperated in advancing the work.

"INDIANS AT WORK"

The mimeographed semimonthly magazine, Indians at Work, has been in increasing demand, not only by Indians and Indian Service personnel, but also by schools, organizations, and individual friends of Indians.

FORESTRY

The work of the Forestry Division embraces the administration of about 8 million acres of forest land and about 36 million acres of range land. These two activities are both aspects of land conservation. They overlap on most of the reservations where there is any timber, for the practice of silviculture directly affects the character of the forage, while the degree of range control is often a determining factor in the success of the silviculture.

The fundamental objective of both forest and range management in the Indian Office is to use these natural resources in a way which will preserve their productivity and at the same time furnish the maximum possible economic and social benefit to the Indians. Our administration of these resources during the fiscal year of 1934 has been more successful in the former than in the latter respect.

LOGGING OPERATIONS

There have been active logging operations on the White River Apache, Klamath, Colville, Menominee, Neah Bay, and Quinaielt Reservations. On the first two reservations the silvicultural practice has been excellent; on the third it has been as good as possible with a very difficult stand of timber with which to work; on the fourth we have cut much too heavily, but plan to remedy this malpractice during the coming year; on the fifth and sixth we have clear-cut the forest, as everyone else in the huge Puget Sound timber does, but we are going to stop this disastrous practice, even though we shall have to work out new methods of selective cutting.

GRAZING MANAGEMENT

Grazing of more than domestic stock takes place on over 50 different reservations. So far as we have yet heard about or observed there is serious overgrazing on only three. These are the Navajo, Hopi, and Papago. In each case the stock is owned by the Indians themselves, and this makes stock reduction much more difficult than would be the case if the range were used by outside lessees. Disaster from erosion and forage destruction are inevitable if we do not make large stock reductions promptly.

Thoroughly effective grazing management is almost impossible when the range is broken up into the large number of small allotments which characterize almost all of the grazing reservations except those in the Southwest. The Wheeler-Howard Act stops further allotments but does not provide any very speedy means of restoring the present broken-up grazing lands into large, singly owned units. To overcome the difficulty of divided ownership in natural range units the power-of-attorney system was devised several years ago by

which individual Indians gave the superintendent the right to grant permits for the use of their land. This worked splendidly where the Indians were satisfied with it, but some tribes, notably the Crows and Blackfeet, did not want to give the superintendent so much power. To meet their complaint we have devised a new system, by which individual Indians will be given a restricted privilege to lease their land to the high bidder on the unit of which their allotment is a part for not less than the bid price, and subject to all grazing regulations. This gives us the two things we are after: solid units and range control. It also gives the Crows and Blackfeet what they want—direct dealing with the lessee.

INDIAN OPERATION SOUGHT

We are still falling down badly in helping the Indians to get the maximum economic and social value for their forest and range. This necessitates that they should use it themselves instead of leasing the privilege to someone else. Using their own resources would give the Indians a much larger income than at present, for they could not only receive the value of their stumpage prices or grazing fees, but also they would make wages; and if their enterprises were properly managed they should be able to make at least as much profit as has come in the past to the lumber and livestock industries. Furthermore, there would be the immense social value of having the Indians working for their income.

The Wheeler-Howard Act, authorizing the appropriation of $10,000,000 for loans to Indian tribes, communities, or individuals, should help to make possible the use of the Indian resources by the Indians themselves. Through capital borrowed from the Government the Indians on most of the reservations should be able to purchase either their own sawmills and logging equipment or a foundation livestock herd with which to utilize their forest and range.

DECENTRALIZATION NEEDED

It seems very important to the satisfactory administration of the Forestry Division that many of the decisions now made in Washington affecting land and individuals 3,000 miles away should hereafter be made in the field, either on the reservations or in the district offices. In order to bring about this decentralization it will be necessary to rewrite our forestry and grazing regulations.

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ROADS

On August 14, $4,000,000 of Public Works funds were allotted to the Indian Service for road construction. The following figures indicate the results obtained by April 1, 1934:

1,450 miles of new road constructed.
2,941 miles of old road improved.
330 miles of road graveled.
345 bridges constructed.
146 old bridges repaired.
1,957 culverts constructed.
11,804 Indians employed.
505 Indians in skilled positions.
445 white men in skilled positions.

We feel that this is a creditable showing. Statistics as of June 30 are not available from the 70 Indian agencies where roads were constructed; it is estimated, however, that the figures for new roads, bridges, etc., will be increased approximately 25 percent.

It is the policy of the Indian Service to construct secondary roads to serve the needs of the Indians and for the administration of their property. Careful consideration is given to secure the best location of each road, to secure good alignment and easy grades so that no money will have been wasted should it ever be decided to improve these roads to a higher standard in the future. Everywhere the overhead costs have been kept to the minimum. Fully 75 percent of the money expended has gone into the Indian laborers' pockets. The balance has gone for machinery, bridge timbers, engineering, etc. Very little road work has been done by contract. It has been found that more Indian employment was possible and better general results obtained through supervision by the Indian Service of its own road work under force account.

Close cooperation is maintained with the county and State highway officials as well as with the Bureau of Public Roads of the Department of Agriculture on all roads on or near Indian reservations in which there is mutual interest. Where local counties are financially unable to improve county roads that cross Indian lands and which serve the Indians, the Indian Service cooperates in improving such roads by furnishing Indian labor and the counties the necessary machinery, engineering, and supervision.

The allotment of $4,000,000 of Public Works funds has served two worthy purposes: The provision of much needed improved roads; and employment for destitute Indians. Road work can be done in every community of every reservation, and at a time of the year when the Indians are not busy with their crops or doing other work.

The Indians are enthusiastic about their road programs and are learning rapidly to assume responsible positions that heretofore have been filled only by whites. The figures above tabulated indicate how rapidly they are filling the skilled positions. Road construction offers a good opportunity to train them to repair and handle all kinds of

machinery and to assume the entire supervision of road construction and road improvements on their reservations.

IRRIGATION

During the year the Secretary of the Interior approved the reorganization of the administrative set-up of Indian irrigation projects; the consolidation of the irrigation personnel of the various projects with the regular agency personnel; and the turning over of responsibility for purely Indian projects to the local superintendents as soon as plans therefor could be perfected. Major projects, especially those containing considerable portions of non-Indian lands, will continue directly under the supervision of the irrigation division, at least until completion of the construction program. This will not only vest local administrative supervision and responsibility with the head of each unit, but will also result in a better correlated unit-program. The supervising engineers will thus be relieved of a large portion of administrative duties, permitting a greater portion of time to be spent on technical duties and advisory work.

PUBLIC WORKS PROJECTS

Shortly after the beginning of the year the Public Works Administration allotted $6,164,050 for construction work on irrigation projects on the various Indian reservations throughout the arid and semiarid Western States. Subsequent allotments totaling $789,000 were received for additional work necessitated by flood and storm damages and for the carrying out of an urgently needed well program on the San Carlos project, Arizona. These funds, totaling in all $6,953,050, are to be expended in the development, storage, and distribution of water to the irrigable lands on the several reservations. Through the end of the fiscal year an actual total of 318,801 man-days of work had been done, of which approximately 56 percent, or 177,680, was by Indians.

In the Southwest area $1,274,050 was allotted principally for the development of new projects and in part for the rehabilitation or enlargement of existing projects, involving the construction of numerous small storage and diversion structures and many miles of main canals and lateral distributary systems. In addition to this, protection from flash floods typical in the southwestern part of the country has been provided either directly from special structures or indirectly from irrigation construction operations. The new projects in this area, either completed or soon to be completed, consist principally of relatively small developments, ranging in size from a few acres to several hundred acres, constructed for subsistence farming by the Indians. In addition to direct irrigation and flood control work in the South-

west, the irrigation division was busy with the location and development of water for domestic and stock consumption as well as for use at the many day schools being constructed in that area.

In the northern and northwestern States, the available Public Works funds were used for the completion *in toto* or in part of the major Indian irrigation projects and the rehabilitation of such projects for more efficient and economical operation.

Water supply work on the Flathead project, Montana, is being completed with the receipt of Public Works funds.

DROUGHT MEASURES

On several of the projects it was necessary to prorate the available water on a greatly curtailed per-acre basis, due to the widespread water shortage. A rotation system of distribution of such water was adopted where feasible and every effort made to conserve the reduced supply. In a great many instances it was necessary to waive existing regulations prohibiting delivery of water until current and all past due charges had been paid, by permitting delivery of water upon payment of current charges and execution of promissory notes adequately secured by chattel mortgages for the unpaid balance from previous years. This action afforded temporary relief which cannot be made permanent until and unless general economic conditions continue to improve.

ROUTINE OPERATIONS

During the year numerous engineering investigations were made in connection with the proposed construction work. Routine operation and maintenance work was carried on at the various projects, consisting of canal and lateral rehabilitation, enlargement and extension, structure replacement and water distribution. Legal activities consisted of the study of various water rights, proposed and pending litigation, and the drafting and review of numerous contracts covering the division's activities. Favorable progress was made toward the final settlement of the so-called "Gila River Adjudication Suit" by way of consent decree. The proposed decree, approved both by the Secretary of the Interior and the Attorney General as drafted, while not entirely satisfactory, represents the most in the way of water-right recognition and safeguards that could be secured in the circumstances. Supplemental repayment contracts were entered into between the Government and both the Flathead and the Mission irrigation districts, Flathead Reservation, Mont. A decision favorable to the United States was rendered by the Circuit Court of Appeals, Ninth Circuit, in the "Moody litigation" when it directed the local district court to dismiss the cases for lack of necessary parties.

Operations by the Middle Rio Grande conservancy district under its contract for irrigation and flood protection work benefiting several of the New Mexico pueblos, progressed very satisfactorily with the completion of numerous features of its approved plan. On several of the benefited pueblos subjugation by the Indians of newly reclaimed areas was successfully undertaken, with the Indians actively interested in the work.

EXTENSION AND INDUSTRY

This division is working toward better living conditions among Indians, principally by encouraging them to help themselves. The reservation extension programs are worked out in cooperation with the Indians, and the work is steadily becoming better organized and its purposes better understood by the Indians.

The agricultural statistics given herewith are for the calendar year 1933.

INDIAN ORGANIZATIONS

There are 604 Indian organizations through which extension programs are promoted, with an active membership of 16,631 men and 9,734 women; a total of 1,228 Indian men and 1,330 women assisted with our various local programs.

Chapter houses, which serve as local community centers, are built as meeting places for these organizations. There are now 131 such houses, 26 having been built during the past year. The Extension Division is making increased use of Indian leadership in forwarding its program.

AGRICULTURE

The agricultural program of the Extension Division is planned to help the Indians to provide more food for themselves, and a more nearly adequate supply of feed for their livestock. Commercial farming for cash-crop production is not neglected, but its importance is secondary.

As in 1932, garden and crop acreages showed satisfactory increases in 1933. Harvests, however, were meager. The full force of the 1933 drought was felt on the Oklahoma, Dakota, and Montana reservations, and it was severe on many others.

A 3-year comparison of garden work on 44 jurisdictions shows the following results:

Year	Acreage	Number of families growing gardens	Size (acres)
1931	13,250	15,251	0.868
1932	19,869	18,358	1.072
1933	21,231	21,309	.996

Indians on 73 reservations operated 30,278 farms in 1933, totaling 604,346 acres. These figures, plus the fact that 58 percent of all families were engaged in farming activities, indicate the realization by the Indians of the necessity of producing a large part of their living from the land. Cooperation was given the Agricultural Adjustment Administration in reducing acreages of certain crops.

LIVESTOCK

Extension activities in livestock included 1,577 demonstrations and 492 demonstration meetings, at which 8,210 Indians were in attendance. A total of 2,014 improved sires were purchased.

Sheep are definitely linked with the welfare of large numbers of Indian people, especially those living in the Southwest. Improvement in sheep and wool is receiving attention, but the overgrazed condition of the range in this section precludes as much improvement as should be made until a program of livestock reduction is put into force. Approximately 86,000 sheep were sold to the Federal Surplus Relief Corporation during the year, relieving conditions considerably.

The numbers of Indian-owned swine have increased to 17,328.

Poultry keeping among Indian people is a comparatively new business. Turkey raising assumes commercial importance on some reservations, $21,354 worth having been sold in 1933. A total of 602 poultry demonstrations were given.

4-H CLUB WORK

A total of 319 organized clubs carried projects with a membership of 1,409 boys and 1,915 girls, of whom 2,398 members completed their work, or 72 percent of those enrolled—an outstanding percentage.

HOME EXTENSION WORK

Indian women are working conspicuously well with our extension staff. Tangible results of their cooperation are shown in the following figures:

In 1933, 3,855 families adopted improved nutrition practices, as against approximately 100 in 1931. As a result of canning and drying demonstrations, 775,318 pounds of fruit, vegetables, and meats were dried, and 532,396 quarts canned. Under Extension Division auspices 42,199 pieces of clothing were made. Four special projects—home-made furniture, home care, home yard care, and the improvement of bedding—were carried on our program in cooperation with the General Federation of Women's Clubs.

FARM AND HOME BUILDING

A special survey of the condition of Indian homes showed the following results:

Type of dwelling	Condition			
	Good	Fair	Poor	Total
Houses	8,952	12,065	10,633	31,650
Hogans	2,816	4,207	3,830	10,853
Tipis, tents, etc	310	360	176	846
Total	12,078	16,632	14,639	43,349

A total of 1,062 new dwellings were constructed at an estimated cost of $388,040; and 1,244 remodeled, with a resulting increased value of $147,961. Barns and outbuildings of various kinds were also built and remodeled.

GENERAL EXTENSION WORK

The following figures summarize general extension work:

Extension workers made 152,825 farm and home visits during the year. A total of 337,982 office calls and 67,943 telephone calls were received. Workers wrote 78,918 individual letters, prepared 1,063 circulars, of which 73,205 copies were sent out, and distributed 26,736 bulletins. Exhibits were shown at 384 events; 246 training meetings were held for local leaders, at which 4,499 were in attendance; 5,163 demonstration meetings were held, with an attendance of 83,457; 168 tours conducted, with an attendance of 2,653; 182 achievement days held, with an attendance of 24,705; and 3,000 other extension meetings arranged, with an attendance of 137,127. There were 1,332 meetings held by local leaders, with an attendance of 19,675. All meetings held during the year totaled 11,128, with an attendance of 309,510.

AGRICULTURAL LEASING

Leasing of Indian farm lands decreased during the year, due to continued low prices of farm products, to drought and grasshopper scourges, and to the efforts of extension workers to convince the Indians that they must use more of their lands themselves in order to become self-supporting. The number of leases decreased from 26,522 in 1932 to 21,452 in 1933, with a reduction in acreage from 2,684,790 to 2,499,422.

REIMBURSABLE FUNDS

The amount actually made available under "Industry among Indians, 1934" was $299,200, of which $40,000 was used for the Pima land subjugation work, leaving $259,200 for general industrial purposes. Allotments of various tribal revolving funds aggregating $161,058.23 were used to supplement this fund, bringing the total to $420,258.23.

The greater proportion of these funds, $372,064.69, was used for industrial loans. Other loans totaling $18,406.45 were made for educational purposes, and subsistence was provided for 203 individual Indians through loans totaling $29,787.09.

COMING DEMANDS

The new land-use program will throw great burdens on our Extension Service and call sharply for its rapid enlargement and enrichment. We must assume that land will not be purchased for Indians to lease to whites; every acre bought must be used by Indians. The purchase program will therefore give extension an important new job in developing these lands for Indian use.

The Indian credit system, to be effective, will demand careful supervision and the making of detailed farm management plans, the organization of Indian stock associations, and the development of many economic enterprises, together with housing projects and the purchase of livestock, farm equipment, seed, and many other things. Here again, extension, including home development, will play a vital role.

INDIAN EMPLOYMENT

PRESENT INDIAN SERVICE EMPLOYMENT OF INDIANS

The drive for employment of Indians in the Indian Service has gone vigorously ahead this year. There are 5,325 persons, Indians and whites, holding regular classified positions in the Indian Service, exclusive of Alaska. Of these, 1,785 are Indians, 489 of whom were appointed this fiscal year. Indians employed in all branches of work—regular, irregular labor, and emergency—numbered 20,017 on June 30, 1934.

OPPORTUNITIES FOR INDIANS

While the greater number of the Indians continue to fill minor positions, Indians are also found in the whole range of positions in the Service, excepting only those of doctors and engineers. The larger groups in the regular positions are found among teachers and clerks.

By Presidential order this year all Indian Service positions under Civil Service are open to Indians by noncompetitive examination. The Civil Service Commission has likewise approved a maximum salary of $1,200 a year instead of the former $720 for the Indian assistant position, and permits employment as Indian assistant to count for experience in classified positions. This latter step provides a means for Indians otherwise qualified and lacking only experience to qualify under schedule B for regular Civil Service positions as vacancies occur. In the Washington office the Indian Employment Division is building up a file of Indians' applications to be drawn

upon in carrying out that provision of the Wheeler-Howard Act which requires that Indians be given first consideration in the filling of vacancies. Definite plans are under way for extended in-service training, as well as for educational opportunities through scholarship loans, so that Indians may fill the more responsible positions of the Service.

WORK OF THE INDIAN EMPLOYMENT DIVISION

During the fiscal year ending June 30, 1934, the Indian Employment Division has been instrumental in placing directly, or in cooperation with the National Reemployment Service and various State employment services, 5,906 Indians in positions outside the Indian Service. This exceeded the corresponding number for the previous fiscal year by 2,682. A large proportion of these were in connection with various emergency projects financed by the Federal Government.

Much of the time of our employment agents in the field has been devoted to recruiting competent Indians for the Indian Service, particularly for Emergency Conservation Work and Public Works. After investigation of their qualifications, 3,584 Indians were placed in skilled and semiskilled work. Of these, 2,194 were placed on Emergency Conservation Work; 118 on Public Works—construction; 678 on Public Works—roads; 189 on Public Works—irrigation; 330 on Civil Works; and 75 in regular Indian Service positions.

The Emergency Conservation Work and Public Works activities have given opportunity for many Indians to win promotion from the ranks to positions of varying degrees of administrative responsibility. One thousand four hundred and one Indians hold positions in Emergency Conservation Work and Public Works of the foremen level or above and in clerical positions. All but 10 of these appointments were made this year.

APPROPRIATIONS

ANNUAL APPROPRIATIONS

The annual recurring expenses of the Indian Service have been further reduced. Congress appropriated $18,996,545.67 from the Federal Treasury, but expenditures therefrom were limited to $16,586,059. Continuing the retrenchment policy, additional reductions have been made for the coming year 1935, for which Congress provided $16,275,185. This amount includes some increase in the amount charged to the Federal Treasury for expenses heretofore borne by Indian tribal funds. It also includes restoration of 5 percent of the pay cut applied to Federal employees. The reduction is in fact greater than shown by the foregoing figures. There follows a comparative statement showing appropriations for the Service for the last 4 years.

	1932	1933	1934	1935
General purposes	$2,587,285.73	$1,840,054.35	$1,593,500.00	$1,325,015
Industrial assistance	1,605,000.00	1,301,000.00	1,233,881.67	1,060,510
Irrigation and water development	497,601.00	457,824.00	599,614.00	450,665
Education	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565
Conservation of health	3,658,000.00	3,508,800.00	3,281,800.00	3,264,595
Support of Indians	2,216,300.00	2,156,300.00	2,141,900.00	2,141,815
Miscellaneous (roads, annuities, etc.)	40,020.00	31,020.00	31,020.00	42,020
Subtotal	20,789,606.73	19,065,998.35	17,984,945.67	16,275,185
Construction	5,570,440.00	1,654,100.00	711,600.00	----------
Roads	670,000.00	1,420,000.00	270,000.00	----------
Total	27,030,046.73	22,140,098.35	18,966,545.67	16,275,185

Specific appropriations from tribal funds were made to supplement the foregoing Treasury appropriations as noted in the following tabulations:

	1932	1933	1934	1935
General purposes	$332,913.98	$126,300	$390,501	$100,000
Industrial assistance	180,532.21	45,000	188,000	35,000
Irrigation and water development	49,500.00	59,000	46,950	6,720
Education	910,000.00	803,000	708,600	599,550
Conservation of health	125,000.00	125,000	131,550	121,490
Support of Indians	1,767,100.00	1,032,380	789,100	564,155
Miscellaneous (roads, annuities, etc.)	50,000.00	25,000	25,000	----------
Total	3,415,046.19	2,215,680	2,279,701	1,426,915

Certain sums are also authorized for expenditure under so-called "permanent and indefinite appropriations." For 1934 these aggregated $5,890,600. This was reduced to $4,876,000 for 1935 and included $311,500 representing construction, operation, and maintenance collections expended on Indian irrigation projects. This money has not heretofore been definitely accounted for either in the budget or annual appropriation act. The appropriations for 1934 from all funds aggregated $24,857,145.67. For 1935 this sum is reduced by $3,705,960.67, making the total sum available for expenditure only $21,151,185. This amount does not include allotments from special funds for Indian Emergency Conservation, Public Works, and other activities in the Indian Service associated with the National Industrial Recovery program.

REDUCTION IN PERSONNEL

Employees in the Washington office in 1932 totaled 210; in 1934 this number was reduced to 175. Expenditures involved were $493,647 and $345,568, respectively. A part of this reduction is accounted for by the transfer of 22 positions with salaries aggregating $53,780 to the purchasing office of the Interior Department. There was a net reduction of 23 employees at the Washington office.

In the entire service during 1932 there were 6,638 regular employees. The total required for salaries was $10,627,724. On July 1, 1934 this

number had been reduced to 5,653. A comparison of the gross amount for salaries is omitted because of the pay reductions in effect during the last year.

The foregoing comparisons do not take into account the activities financed from emergency funds such as emergency conservation and public works.

PUBLIC WORKS

During the year a total of $19,034,550 was allotted from the public works appropriation for Indian Service projects. This may be divided into headings approximately as follows:

Day schools	$3, 613, 000
Hospitals	1, 815, 500
Roads and bridges	4, 028, 500
Irrigation and drainage	5, 953, 050
Subjugation of raw lands (Pima)	1, 000, 000
Quarters for personnel	433, 000
Land utilization institute, Navajo	950, 000
Water and sewer systems	301, 500
Heating and power plants	295, 000
Alaska, small items	100, 000
Miscellaneous structure	545, 000
Total public works	19, 034, 550

The major undertakings under the public works program are discussed elsewhere in this report under the functional activities involved.

ALTERNATE BUDGET

The act of March 2, 1933 directed the submission of an alterante arrangement of Indian Office estimates for the fiscal year 1935. Such an arrangement was prepared and submitted but was not adopted by Congress. We have tried to obtain legislation requiring the submission of a new simplified budget, set up on geographic and functional lines, in place of the present unsatisfactory budget; but so far without success. It is hoped that intelligent Indian Service budgets can eventually be formulated. The provisions of the Wheeler-Howard Act will eventually force the change, inasmuch as we will be required to submit estimates to local Indian groups in advance of transmission of estimates to the Budget Bureau and to Congress.

CONSTRUCTION

A total of $981,600 was provided from regular appropriation for construction purposes during this year. Practically all of this amount was withdrawn from expenditure to be replaced later by allotments from the public works appropriation. The amount normally available for annual expenditure for construction during the year was

increased many times through the public works allotments. The Bureau has not been able to prepare plans and specifications for projects in advance of the availability of funds. Consequently, when money was provided for day schools, hospitals, heating, water, sewer, and power systems, and miscellaneous buildings, the small technical staff was insufficient in size to design structures and draft specifications so that construction could be speedily undertaken. A contract was therefore negotiated with a firm of New York architects for preparing plans and specifications for practically all the projects in the Southwest and a number of other projects located in other parts of the Indian country. Later, when funds became available for new hospital construction, a contract was negotiated with a firm of Chicago architects having broad experience in designing hospitals. The plans drafted by these firms of private architects have taken into account the use of native material, where possible, and employment of local Indians. The design of buildings in the Southwest is simple and distinctly Indian. Use of native material in the erection of buildings will not only bring work opportunities to local Indians but will provide an incentive for individuals and groups to better their own types of construction.

As an aid in expediting the public works program, a field construction office was established in Albuquerque, N.Mex. This office is staffed with an adequate number of clerical and technical employees and necessary supervisory personnel has been appointed to oversee actual construction. Local superintendents in this area have been relieved of construction responsibilities and the disbursement of funds connected therewith. A similar central office smaller in size has been established at Billings, Mont. Here the construction employees will handle the technical details including supervision of construction, and advertising for material and supplies, but the local superintendents will disburse the funds. A third office is located at Muskogee, Okla., but because of the small volume of business it has not been found necessary to greatly increase the personnel for construction in this territory.

At the close of the fiscal year, projects aggregating ultimate expenditures of approximately $14,000,000 were under way and a number had been completed. With few exceptions, it is anticipated that by June 30, 1935, all projects will be completed.

RECENT DEVELOPMENTS

Reorganization of Indian Service.—Various administrative readjustments, set in motion during the year, and looking toward administrative decentralization, with regional and reservation planning, were brought together in circular 3011, dated July 14, 1934.

Navajo reorganization.—Radical reorganizations of Navajo administration were set under way during the year. One central headquarters will replace 6, and the services and human contacts will be decentralized into more than 20 local headquarters, which usually will be placed in the new day schools. Each local area will be a project area, resting upon a local organization of the Indians. The Indian Service in all its branches, and the Soil Erosion Service, will clear their local contacts in each area through the local subagent, who will be the school principal, or stockman, or soil engineer, or public health nurse, as the case may be. Interferences from Washington will be diminished. And in the local areas, if present purposes can be carried out, the mass of the Indians will be reached through their Navajo language, as well as through English.

As part of the new Navajo program, a study of the methods of trading on the reservation and of the Navajo economic situation in its totality is being made by Dr. B. Youngblood, loaned to the Soil Erosion Service and the Indian Service by the Department of Agriculture.

The largest soil-erosion area, among the numerous areas in different parts of the country which are being dealt with by the Soil Erosion Service of the Department of the Interior, is the combined Navajo and Zuni area. Unity of effort between the Soil Erosion Service and the Indian Service, through this largest segment of the Indian country, is complete.

Indian arts and crafts.—A committee, appointed by the Secretary of the Interior and headed by Prof. James W. Young of the University of Chicago, is making a study of Indian arts and crafts, with a view to determining how these Indian assets may be protected, brought into a larger and better market, and made permanent in the life both of the Indians and of the Nation.

Civil works of art.—Under the Civil Works Administration, beautiful murals and other painting and craft works were carried out by the Indians.

Affiliations with anthropology.—An anthropological consultant group, advisory to the Secretary of the Interior, was formed during the year. Dr. Duncan Strong, of the Smithsonian Institution, was designated liaison officer between that Institution and the Indian Service.

Training for careers in the Indian Service.—Negotiations were opened with a number of the universities, looking to the establishment of courses to prepare for careers in the Indian Service. In addition, plans, which will mature during the year ahead, were made for the in-service training of employed workers.

Cooperation of Indian welfare organizations.—Throughout the year, generous cooperation and needed criticism were received from the General Federation of Women's Clubs, the American Indian Defense Association, Inc., the National Association on Indian Affairs, Inc., the Indian Rights Association, and some other groups. The Indian Service, for its continuing improvement, is greatly dependent on such help and criticism from unofficial and wholly independent agencies.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among the absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

The tabulation of each census roll by reservation was made in the field by the various agencies and assembled as a whole in the Indian Office.

The total of estimated and enumerated number of Indians thus reported in 1934 was 327,958. This number consists of 234,792 Indians actually enumerated and 93,166 Indians taken from earlier or special censuses and estimates based on records. For convenience, the latter number will be considered hereafter as an estimate. (See tabular statement below.)

The Bureau of the Census reported 72,626 Indians of the Five Civilized Tribes in 1930, and this number has been substituted for our previous estimated population of the Five Civilized Tribes. The population by tribe is as follows: Cherokee, 40,904; Chickasaw, 4,685; Choctaw, 16,641; Creek, 8,607; and Seminole, 1,789. (See page 40 of the Annual Report of the Commissioner of Indian Affairs, June 30, 1931, for further discussion on the estimated population for Five Civilized Tribes.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on April 1, 1934 represents an increase over the

corresponding figure for the previous year of 7,504, or 2.3 percent. Over one-half of this increase is accounted for by the addition of 4,483 Indians in California. (See statement, p. 123.)

Of the 234,792 Indians enumerated, 119,724 were males; 115,068, females.

It is significant, when the Indians enumerated are considered, that 200,744, or 85.5 percent, resided at Federal jurisdiction where enrolled, while only 5,015, or 2.1 percent, resided at another jurisdiction, and 29,033, or 12.4 percent resided elsewhere; that is, outside of any Federal jurisdiction.

Of the 32,447 Indians residing elsewhere on April 1, 1930, 41 were living in the New England States, 208 in the Middle Atlantic, 3,633 in the East North Central, 9,234 in the West North Central, 437 in the South Atlantic, 93 in the East South Central, 2,166 in the West South Central, 5,120 in the Mountain States, and 6,024 in the Pacific States, and for 5,491 Indians the residence was either not reported or unknown.

The Indian population is nearly all in 22 States. The combined population of 4 States, Oklahoma, Arizona, New Mexico, and South Dakota, is 200,494, or 61.1 percent of the total Indian population; while 290,547, or 88.6 percent, are in 10 States (including the 4 above States), leaving only 37,411 Indians in the other 39 States, including the District of Columbia.

Oklahoma has far more Indians than any other State. If the Federal Census population of the Five Civilized Tribes is included, the Indian population is 94,980, or 29 percent of the aggregate Indian population. Arizona ranks next with 44,093, or 13.4 percent, followed by New Mexico with 34,726, or 10.6 percent, and South Dakota, 26,695, or 8.1 percent of the total. The other 6 Indian States are: California, 23,808; Montana, 15,255; Minnesota, 15,200; Washington, 13,418; Wisconsin, 12,085; North Dakota, 10,287.

According to a tabulation of the tribes enumerated on April 1, 1930, the most important numerically were the Navajo, Sioux, including Assiniboin, and Chippewa, numbering 40,862, 33,168, and 23,647, respectively.

Heretofore the entire population of Western Navajo Reservation was reported under Arizona. This year, the population of the reservation extending over into Utah is included under that State; hence the seeming decrease in the population of Western Navajo Reservation in Arizona.

Unusual changes in the population of other agencies are also shown, and this is caused by the transfer of reservations from one jurisdiction to another. Such changes are shown in table 2 by footnote.

The Indian population not actually enumerated (termed an estimate) is 93,166 which is compiled as follows:

California, Sacramento Agency, part of 1930 estimate		8, 761
California, Indian Census, May 16, 1933, not otherwise reported		4, 483
Michigan, 1927 census		1, 192
New York, 1932 estimate		4, 523
Oklahoma, Five Civilized Tribes, Bureau of the Census, 1930:		
Cherokee	40, 904	
Chickasaw	4, 685	
Choctaw	16, 641	
Creek	8, 607	
Seminole	1, 789	
		72, 626
Texas, 1931 special report		250
Washington, Taholah Agency, scattered bands, 1932 estimate [1]		511
Wisconsin:		
Rice Lake band of Chippewas, special census, July 1930		221
Stockbridge Reservation, Keshena Agency, 1910 census		599

The following Indian statistics are from bulletins issued by the Bureau of the Census, Department of Commerce, 1930, and are for Indians in continental United States.

According to the Bureau of the Census, 299,581 Indians, or 90.1 percent of the entire Indian population, reside in rural communities, while the number living in urban communities was only 32,816.

The Indians 5 to 20 years of age attending school in the United States in 1930 numbered 77,806, or 60.2 percent. The corresponding proportions for 1920, 1910, and 1900 are 53.8, 50.8, and 40.4, respectively, which show a constant climb in the number of Indian children in school.

The illiterate Indians 10 years of age and over in 1930 numbered 61,517, or 25.7 percent. This is an enormous drop from 56.2 percent in 1900, 45.3 percent in 1910, and 34.9 percent in 1920. Each decade has shown a considerable decrease in the Indian illiteracy.

The Indian population in the 25 States in which there were no Federal agencies in 1930 was 10,456. Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2. See the 1933 Annual Report of the Secretary of the Interior, page 112, table 1.

Table 1.—Indian Population by Age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All ages	**332, 397**	**170, 350**	**162, 047**	25 to 29 years	23, 491	12, 127	11, 364
				30 to 34 years	19, 309	10, 032	9, 277
Under 5 years	46, 680	23, 447	23, 233	35 to 44 years	33, 031	17, 285	15, 746
Under 1 year	9, 296	4, 681	4, 615	45 to 54 years	25, 039	13, 403	11, 636
5 to 9 years	46, 736	23, 434	23, 302	55 to 64 years	16, 787	9, 178	7, 609
10 to 14 years	39, 456	20, 028	19, 428	65 to 74 years	10, 030	5, 257	4, 773
15 to 19 years	36, 219	18, 154	18, 065	75 and over	6, 327	3, 079	3, 248
20 to 24 years	28, 843	14, 697	14, 146	Unknown	449	229	220

Source: Bureau of the Census, Department of Commerce.

[1] During 1933, 150 Indians of the scattered bands were allotted on the Quinaielt Reservation and included in the enumerated population, table 2.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total enumerated Indian population [1]	**234,792**	**119,724**	**115,068**	**200,744**	**103,037**	**97,707**	**5,015**	**2,464**	**2,551**	**29,033**	**14,223**	**14,810**
Arizona [2]	**44,093**	**22,772**	**21,321**	**42,744**	**22,072**	**20,672**	**197**	**89**	**108**	**1,152**	**611**	**541**
Colorado River Agency	**1,137**	**625**	**512**	**627**	**344**	**283**	**28**	**19**	**9**	**482**	**262**	**220**
Colorado River Reservation	**705**	**380**	**325**	**559**	**300**	**259**	**22**	**16**	**6**	**124**	**64**	**60**
Chemehuevi	279	137	142	181	89	92	1		1	97	48	49
Chemehuevi-Chippewa	1	1		1	1							
Chemehuevi-Paiute	3	2	1							3	2	1
Chemehuevi-Papago	1	1								1	1	
Cocopah	4	1	3				1		1	3	1	2
Mission	1	1		1	1							
Mojave	359	198	161	334	182	152	10	8	2	15	8	7
Mojave-Chemehuevi	22	16	6	18	13	5				4	3	1
Mojave-Cocopah	4	2	2	4	2	2						
Mojave-Hopi	1	1		1	1							
Mojave-Papago	8	4	4	8	4	4						
Mojave-Pawnee	1		1	1		1						
Mojave-Pima	2	1	1	2	1	1						
Mojave-Pueblo	1	1		1	1							
Mojave-Yuma	16	12	4	7	5	2	9	7	2			
Paiute	1	1								1	1	
Yuma	1	1					1	1				
Fort Mojave Reservation	**432**	**245**	**187**	**68**	**44**	**24**	**6**	**3**	**3**	**358**	**198**	**160**
Chemehuevi	3	1	2							3	1	2
Maidu	1		1							1		1
Mojave	410	237	173	67	43	24	3	3		340	191	149
Mojave-Maidu	1	1								1	1	
Mojave-Mission	4	2	2							4	2	2
Mojave-Paiute	3		3							3		3
Mojave-Pima	5	2	3							5	2	3
Mojave-Yuma	5	2	3	1	1		3		3	1	1	
Fort Apache Agency and Reservation (Apache)	**2,718**	**1,424**	**1,294**	**2,671**	**1,402**	**1,269**	**9**	**5**	**4**	**38**	**17**	**21**
Fort Yuma Agency, in California, and Cocopah Reservation (Cocopah)	**32**	**20**	**12**	**32**	**20**	**12**						
Hopi Agency and Reservation	**6,095**	**3,173**	**2,922**	**5,997**	**3,126**	**2,871**	**10**	**7**	**3**	**88**	**40**	**48**
Hopi	2,538	1,318	1,220	2,457	1,280	1,177	6	4	2	75	34	41
Hopi-Blackfeet	2	2					2	2				
Hopi-Cherokee	1		1	1		1						
Hopi-Klamath	2	1	1	2	1	1						
Hopi-Navajo	13	4	9	13	4	9						
Hopi-Papago	2	1	1	2	1	1						

Hopi-Pima	18	8	10	15	7	8				3	1	2
Hopi-Pueblo	13	7	6	8	5	3				5	2	3
Hopi-Shasta	5	2	3	5	2	3						
Hopi-Shoshone	9	5	4	4	2	2				5	3	2
Navajo	3,492	1,825	1,667	3,490	1,824	1,666	2	1	1			
Leupp Agency and Navajo Reservation	**1,963**	**999**	**964**	**1,959**	**997**	**962**	**3**	**2**	**1**	**1**		**1**
Navajo	1,953	995	958	1,949	993	956	3	2	1	1		1
Navajo-Hopi	2	2		2	2							
Navajo-Oneida	5	2	3	5	2	3						
Oneida	2		2	2		2						
Paiute	1		1	1		1						
Paiute Agency, in Utah, and Kaibab Reservation (Paiute)	**93**	**55**	**38**	**88**	**53**	**35**	**1**	**1**		**4**	**1**	**3**
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)[3]	**451**	**250**	**201**	**307**	**174**	**133**	**2**		**2**	**142**	**76**	**66**
Pima Agency[3 4 5]	**6,092**	**3,136**	**2,956**	**5,882**	**3,036**	**2,846**	**96**	**30**	**66**	**114**	**70**	**44**
Chui-Chuischu Reservation (Papago)[5]	**179**	**94**	**85**	**179**	**94**	**85**						
Fort McDowell Reservation (Mojave-(Apache)[3]	**205**	**115**	**90**	**181**	**102**	**79**	**7**	**2**	**5**	**17**	**11**	**6**
Gila River Reservation[6]	**4,659**	**2,391**	**2,268**	**4,571**	**2,347**	**2,224**	**30**	**8**	**22**	**58**	**36**	**22**
Maricopa	539	263	276	534	260	274				5	3	2
Maricopa-Apache	1	1		1	1							
Maricopa-Cheyenne	7	5	2	7	5	2						
Maricopa-Hopi	2		2	2		2						
Maricopa-Klamath	10	3	7	10	3	7						
Maricopa-Klamath-Pima	16	10	6	16	10	6						
Maricopa-Mojave	1	1		1	1							
Maricopa-Pima	8	3	5	8	3	5						
Papago	60	30	30	60	30	30						
Pima	3,913	2,029	1,884	3,836	1,992	1,844	27	6	21	50	31	19
Pima-Apache	8	3	5	5	1	4				3	2	1
Pima-Choctaw	4	2	2	4	2	2						
Pima-Crow	6	3	3	6	3	3						
Pima-Hopi	2	2		2	2							
Pima-Klamath	1		1	1		1						
Pima-Maricopa	5	1	4	5	1	4						
Pima-Mission	6	3	3	6	3	3						
Pima-Mojave	3		3	3		3						
Pima-Navajo	8	4	4	8	4	4						
Pima-Oneida	3	2	1	3	2	1						
Pima-Ottawa	2		2	2		2						
Pima-Paiute	4	1	3	4	1	3						
Pima-Papago	34	19	15	34	19	15						
Pima-Pueblo	3		3	3		3						
Pima-Pueblo-Seneca	1	1		1	1							
Pima-Seneca	8	3	5	8	3	5						
Pima-Yaqui	1		1	1		1						
Pima-Yuma	3	2	1				3	2	1			

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arizona—Continued.												
Pima Agency—Continued.												
Salt River Reservation [3]	1,049	536	513	951	493	458	59	20	39	39	23	16
Apache	2		2	2		2						
Maricopa	2	2		2	2							
Papago	1		1	1		1						
Pima	1,043	534	509	945	491	454	59	20	39	39	23	16
Pueblo	1		1	1		1						
San Carlos Agency and Reservation (Apache)	2,843	1,455	1,388	2,831	1,447	1,384	3	2	1	9	6	3
Sells Agency [4] [5]	5,899	3,016	2,883	5,889	3,010	2,879	10	6	4			
Gila Bend Reservation (Papago) [4]	228	125	103	228	125	103						
Papago Reservation [5]	5,146	2,616	2,530	5,136	2,610	2,526	10	6	4			
Papago	5,136	2,610	2,526	5,136	2,610	2,526						
Pima	10	6	4				10	6	4			
San Xavier Reservation (Papago)	525	275	250	525	275	250						
Southern Navajo Agency and Navajo Reservation, see New Mexico (Navajo)	11,546	5,965	5,581	11,536	5,962	5,574	6	3	3	4		4
Truxton Canon Agency [7]	652	344	308	381	202	179	9	6	3	262	136	126
Havasupai Reservation [7]	201	111	90	199	109	90	1	1		1	1	
Havasupai	192	105	87	190	103	87	1	1		1	1	
Havasupai-Walapai	9	6	3	9	6	3						
Hualapai Reservation	451	233	218	182	93	89	8	5	3	261	135	126
Walapai	440	224	216	177	89	88	7	5	2	256	130	126
Walapai-Cherokee	1	1								1	1	
Walapai-Havasupai	7	6	1	5	4	1				2	2	
Walapai-Hoopa	3	2	1				1		1	2	2	
Western Navajo Agency, and Navajo Reservation, see Utah [2]	4,572	2,310	2,262	4,544	2,299	2,245	20	8	12	8	3	5
Hopi	418	219	199	398	212	186	16	6	10	4	1	3
Navajo	4,122	2,072	2,050	4,118	2,070	2,048				4	2	2
Paiute	32	19	13	28	17	11	4	2	2			
California	10,564	5,414	5,150	8,939	4,636	4,303	35	20	15	1,590	758	832
Fort Yuma Agency, see Arizona, and Fort Yuma Reservation (Yuma)	819	422	397	748	385	363	4	2	2	67	35	32
Hoopa Valley Agency	1,953	963	990	1,506	755	751	9	4	5	438	204	234
Hoopa Valley Reservation	1,542	755	787	1,274	631	643	9	4	5	259	120	139
Hoopa	554	287	267	494	258	236	9	4	5	51	25	26
Hoopa-Klamath	3	2	1	3	2	1						
Klamath	985	466	519	777	371	406				208	95	113

Rancheria	411	208	203	232	124	108				179	84	95
Bear River (Bear River)	23	13	10	19	11	8				4	2	2
Blue Lake (Blue Lake)	69	36	33	44	19	25				25	17	8
Crescent City (Smith River)	48	19	29							48	19	29
Eel River (Miami)	154	79	75	85	48	37				69	31	38
Smith River (Smith River)	117	61	56	84	46	38				33	15	18
Mission Agency	2,897	1,537	1,360	2,073	1,145	928	6	2	4	818	390	428
Augustine Reservation (Mission)	14	8	6	13	7	6				1	1	
Cabezon Reservation (Mission)	29	18	11	24	13	11				5	5	
Cahuilla Reservation (Mission)	107	55	52	65	34	31				42	21	21
Campo Reservation (Mission)	135	70	65	117	59	58	1	1		17	10	7
Capitan Grande Reservation (Mission)	160	82	78	141	78	63				19	4	15
Cuyapaipe Reservation (Mission)	5	1	4	3		3				2	1	1
Inaja Reservation (Mission)	33	16	17	30	13	17				3	3	
Laguna Reservation (Mission)	3	2	1	3	2	1						
LaJolla Reservation (Mission)	221	120	101	144	83	61				77	37	40
LaPosta Reservation (Mission)	3	1	2	2	1	1				1		1
Los Coyotes Reservation (Mission)	88	51	37	72	46	26				16	5	11
Manzanita Reservation (Mission)	67	30	37	58	29	29				9	1	8
Mesa Grande Reservation (Mission)	218	122	96	149	88	61	3	1	2	66	33	33
Mission Creek Reservation (Mission)	20	10	10	13	7	6				7	3	4
Morongo Reservation (Mission)	292	155	137	191	112	79				101	43	58
Pala Reservation (Mission)	205	108	97	151	84	67				54	24	30
Palm Springs Reservation (Mission)	50	25	25	49	25	24				1		1
Pauma Reservation (Mission)	69	37	32	47	27	20				22	10	12
Pechanga Reservation (Mission)	216	108	108	101	55	46				115	53	62
Rincon Reservation (Mission)	181	98	83	111	60	51				70	38	32
San Manuel Reservation (Mission)	40	22	18	26	15	11				14	7	7
San Pascual Reservation (Mission)	9	4	5	9	4	5						
Santa Rosa Reservation (Mission)	50	31	19	23	13	10				27	18	9
Santa Ynez Reservation (Mission)	90	43	47	19	11	8				71	32	39
Santa Ysabel Reservation (Mission)	237	127	110	192	106	86	1		1	44	21	23
Soboba Reservation (Mission)	122	61	61	106	52	54				16	9	7
Syeuan Reservation (Mission)	35	16	19	35	16	19						
Torres-Martenez Reservation (Mission)	198	116	82	179	105	74	1		1	18	11	7
Sacramento Agency	3,317	1,703	1,614	3,121	1,597	1,524	10	8	2	186	98	88
Fort Bidwell Reservation	136	81	55	98	55	43	8	7	1	30	19	11
Mojave	1		1							1		1
Paiute	128	79	49	95	54	41	8	7	1	25	18	7
Paiute-Mojave	3	1	2							3	1	2
Paiute-Wasco	3	1	2	3	1	2						
Snohomish	1		1							1		1
Fort Bidwell Reserve and Public Domain Allotments	433	209	224	337	162	175				96	47	49
Maidu	1	1		1	1							
Paiute	109	53	56	19	8	11				90	45	45
Pit River	307	148	159	301	146	155				6	2	4
Pit River-Paiute	16	7	9	16	7	9						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Sacramento Agency—Continued.												
Round Valley Reservation	**827**	**417**	**410**	**796**	**398**	**398**	**2**	**1**	**1**	**29**	**18**	**11**
Kato	1	1		1	1							
Maidu	190	102	88	189	101	88				1	1	
Mission-Pomo	3	1	2	3	1	2						
Papago	1	1		1	1							
Papago-Pomo	3		3	3		3						
Pit River	40	24	16	38	23	15				2	1	1
Pit River-Pomo	5	4	1	5	4	1						
Pomo	105	49	56	97	43	54	2	1	1	6	5	1
Pomo-Maidu	25	12	13	25	12	13						
Pomo-Wailaki	19	8	11	19	8	11						
Pomo-Wintoon-Wailaki	2	2		2	2							
Wailaki	191	86	105	179	80	99				12	6	6
Wailaki-Maidu	16	9	7	16	9	7						
Wailaki-Wintoon	5	1	4	4		4				1	1	
Whilkut	12	9	3	10	7	3				2	2	
Wintoon	111	60	51	107	59	48				4	1	3
Wintoon-Maidu	5	2	3	5	2	3						
Wintoon-Pomo	3	2	1	3	2	1						
Yuki	67	30	37	66	29	37				1	1	
Yuki-Kato	4	2	2	4	2	2						
Yuki-Maidu	4	3	1	4	3	1						
Yuki-Pomo	14	9	5	14	9	5						
Yuki-Wailaki	1		1	1		1						
Tulare County Indians[89]	**121**	**66**	**55**	**121**	**66**	**55**						
Apache-Navajo	1	1		1	1							
Cherokee	2	2		2	2							
Cherokee-Waksachi	4	2	2	4	2	2						
Chuckchansi	1	1		1	1							
Intimbich	6	4	2	6	4	2						
Intimbich-Wikchamni	13	6	7	13	6	7						
Koyati	1	1		1	1							
Koyati-Waksachi	2	1	1	2	1	1						
Monachi	5	3	2	5	3	2						
Tachi	2	1	1	2	1	1						
Tachi-Waksachi	4	3	1	4	3	1						
Tachi-Wikchamni	5	2	3	5	2	3						
Tejon	19	9	10	19	9	10						
Waksachi	21	11	10	21	11	10						
Wikchamni	22	12	10	22	12	10						

Wikchamni-Cherokee	2		2	2		2						
Yawilmani	9	6	3	9	6	3						
Yawilmani-Waksachi	2	1	1	2	1	1						
Tule River Reservation	**186**	**96**	**90**	**171**	**88**	**83**				**15**	**8**	**7**
Koyati	1	1		1	1							
Pankahlachi	41	22	19	34	20	14				7	2	5
Serrano	4	2	2	4	2	2						
Serrano-Yawilmani	6	3	3	6	3	3						
Tachi	1		1	1		1						
Tejon	15	8	7	15	8	7						
Tejon-Wikchamni	3	2	1	3	2	1						
Tejon-Yawilmani	7	2	5	7	2	5						
Wikchamni	20	11	9	20	11	9						
Wikchamni-Tachi	3	2	1	3	2	1						
Yaudanchi	1	1		1	1							
Yawilmani	73	35	38	65	29	36				8	6	2
Yawilmani-Pankahlachi	7	4	3	7	4	3						
Yawilmani-Tejon-Wikchamni	1		1	1		1						
Yawilmani-Wikchamni	3	3		3	3							
Rancheria [9]	**587**	**305**	**282**	**587**	**305**	**282**						
Chowchilla	3	1	2	3	1	2						
Chukchansi	101	58	43	101	58	43						
Chukchansi-Monachi	21	10	11	21	10	11						
Chukchansi-Paiute	1	1		1	1							
Mission-Navajo	1	1		1	1							
Miwok	4	2	2	4	2	2						
Monachi	445	226	219	445	226	219						
Monachi-Shawnee	3	1	2	3	1	2						
Paiute	1	1		1	1							
Shawnee	1	1		1	1							
Tachi	4	2	2	4	2	2						
Tachi-Monachi	2	1	1	2	1	1						
Public Domain Allotments [9]	**1,027**	**529**	**498**	**1,011**	**523**	**488**				**16**	**6**	**10**
Apache	1	1		1	1							
Chowchilla	13	6	7	13	6	7						
Chowchilla-Monachi	2	2		2	2							
Chuckchansi	181	88	93	181	88	93						
Chuckchansi-Monachi	19	8	11	19	8	11						
Chuckchansi-San Luis Rey	5	5		5	5							
Fernandeno	2	1	1	2	1	1						
Klamath	1	1		1	1							
Mission	1	1		1	1							
Miwok	58	30	28	58	30	28						
Miwok-Washo	2	1	1	2	1	1						
Monachi	428	226	202	428	226	202						
Monachi-Mission	3	2	1	3	2	1						
Paiute	118	56	62	118	56	62						
Paiute-Pit River-Washo	2	1	1	2	1	1						
Pit River-Paiute	1		1	1		1						
Pueblo	1	1		1	1							
Pueblo-Paiute	2	1	1	2	1	1						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Fenale	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Sacramento Agency—Continued.												
Public Domain Allotments—Continued.												
San Fernandeno-Tejon	8	2	6	8	2	6						
San Luis Rey	1		1	1		1						
Serrano	1	1		1	1							
Serrano-Tejon	2		2	2		2						
Shoshone	4	3	1	4	3	1						
Tejon	38	22	16	38	22	16						
Washo	128	67	61	112	61	51				16	6	10
Wintoon	2	1	1	2	1	1						
Wintoon-Monachi	3	2	1	3	2	1						
Walker River Agency, in Nevada, and Fort Independence and Indian Ranch Reservations, Homesite Tracts, and Bishop scattered bands	**1,578**	**789**	**789**	**1,491**	**754**	**737**	**6**	**4**	**2**	**81**	**31**	**50**
Maidu	5	2	3	3	2	1				2		2
Monachi	1	1		1	1							
Paiute	1,324	663	661	1.242	630	612	6	4	2	76	29	47
Paiute-Laguna	2		2	2		2						
Paiute-Maidu	19	11	8	19	11	8						
Paiute-Pomo	2	2		2	2							
Paiute-Shoshone	6	2	4	6	2	4						
Pomo	1		1	1		1						
Shoshone	189	95	94	186	93	93				3	2	1
Washo	29	13	16	29	13	16						
Colorado	**834**	**424**	**410**	**822**	**418**	**404**	**8**	**3**	**5**	**4**	**3**	**1**
Consolidated Ute Agency, see Utah	**834**	**424**	**410**	**822**	**418**	**404**	**8**	**3**	**5**	**4**	**3**	**1**
Southern Ute Reservation (Ute)	**389**	**192**	**197**	**381**	**188**	**193**	**6**	**3**	**3**	**2**	**1**	**1**
Ute Mountain Reservation (Ute)	**445**	**232**	**213**	**441**	**230**	**211**	**2**		**2**	**2**	**2**	
Florida: Seminole Agency and Reservation (Seminole)	**580**	**289**	**291**	**580**	**289**	**291**						
Idaho	**4,187**	**2,074**	**2,113**	**3,538**	**1,745**	**1,793**	**173**	**100**	**73**	**476**	**229**	**247**
Coeur d'Alene Agency, see Washington [10]	**2,150**	**1,023**	**1,127**	**1,742**	**819**	**923**	**119**	**70**	**49**	**289**	**134**	**155**
Coeur d'Alene Reservation	**634**	**308**	**326**	**446**	**218**	**228**	**14**	**9**	**5**	**174**	**81**	**93**
Coeur d'Alene	550	274	276	372	186	186	11	7	4	167	81	86
Coeur d'Alene-Blackfeet	1		1							1		1
Coeur d'Alene-Cherokee	9	5	4	8	4	4	1	1				
Coeur d'Alene-Chippewa	1		1	1		1						
Coeur d'Alene-Colville	7	1	6	6	1	5	1		1			
Coeur d'Alene-Cree	14	7	7	14	7	7						
Coeur d'Alene-Flathead	14	5	9	11	5	6				3		3

Coeur d'Alene-Kalispel	1	1		1	1							
Coeur d'Alene-Kootenai	2		2	2		2						
Coeur d'Alene-Maidu	1		1							1		1
Coeur d'Alene-Nez Perce	2	1	1	2	1	1						
Coeur d'Alene-Okanagan	3	2	1	3	2	1						
Coeur d'Alene-Spokane	19	7	12	16	6	10	1	1		2		2
Coeur d'Alene-Umatilla	8	3	5	8	3	5						
Cree	2	2		2	2							
Kootenai Reservation	**117**	**60**	**57**	**103**	**54**	**49**				**14**	**6**	8
Kootenai	111	58	53	100	52	48				11	6	5
Kootenai-Colville	6	2	4	3	2	1				3		3
Nez Perce Reservation [10]	**1,399**	**655**	**744**	**1,193**	**547**	**646**	**105**	**61**	**44**	**101**	**47**	**54**
Nez Perce	1.365	641	724	1.169	538	631	95	56	39	101	47	54
Nez Perce-Cayuse	1	1					1	1				
Nez Perce-Choctaw	1	1					1	1				
Nez Perce-Coeur d'Alene	4	1	3	3	1	2	1		1			
Nez Perce-Paiute	1		1				1		1			
Nez Perce-Shoshone	3	1	2	3	1	2						
Nez Perce-Sioux	4	2	2	4	2	2						
Nez Perce-Umatilla	6	2	4	6	2	4						
Nez Perce-Yakima	7	3	4	1		1	6	3	3			
Seneca-Nez Perce	7	3	4	7	3	4						
Fort Hall Agency and Reservation, see Utah	**1,839**	**944**	**895**	**1,617**	**828**	**789**	**38**	**22**	**16**	**184**	**94**	**90**
Bannock	274	139	135	201	102	99	10	4	6	63	33	30
Bannock-Shoshone	76	34	42	71	32	39	3	2	1	2		2
Chehalis-Shoshone	1		1	1		1						
Maidu-Bannock	1		1	1		1						
Mission-Shoshone	1		1	1		1						
Shoshone	1.307	688	619	1,176	618	558	23	14	9	108	56	52
Shoshone-Bannock	179	83	96	166	76	90	2	2		11	5	6
Western Shoshone Agency and Reservation, in Nevada	**198**	**107**	**91**	**179**	**98**	**81**	**16**	**8**	**8**	**3**	**1**	**2**
Paiute	121	68	53	105	61	44	15	7	8	1		1
Paiute-Washo	1		1	1		1						
Shoshone	29	16	13	27	15	12				2	1	1
Shoshone-Paiute	46	22	24	45	21	24	1	1				
Washo-Paiute	1	1		1	1							
Iowa: Sac and Fox Sanatorium Jurisdiction and Reservation (Sac and Fox of the Mississippi)	**419**	**213**	**206**	**378**	**194**	**184**	**25**	**9**	**16**	**16**	**10**	**6**
Kansas	**1,860**	**958**	**902**	**1,472**	**776**	**696**	**195**	**96**	**99**	**193**	**86**	**107**
Haskell Institute Jurisdiction	**1,860**	**958**	**902**	**1,472**	**776**	**696**	**195**	**96**	**99**	**193**	**86**	**107**
Iowa Reservation (Iowa)	**498**	**266**	**232**	**471**	**254**	**217**	**3**	**1**	**2**	**24**	**11**	**13**
Kickapoo Reservation (Kickapoo)	**308**	**159**	**149**	**252**	**136**	**116**	**23**	**13**	**10**	**33**	**10**	**23**
Potawatomi Reservation (Potawatomi)	**955**	**488**	**467**	**678**	**353**	**325**	**149**	**73**	**76**	**128**	**62**	**66**
Sac and Fox Reservation (Sac and Fox of the Missouri)	**99**	**45**	**54**	**71**	**33**	**38**	**20**	**9**	**11**	**8**	**3**	**5**

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Minnesota	15,200	7,644	7,556	10,840	5,597	5,243	398	189	209	3,962	1,858	2,104
Consolidated Chippewa Agency	12,680	6,352	6,328	8,875	4,583	4,292	368	177	191	3,437	1,592	1,845
Boise Fort Reservation (Chippewa)	627	299	328	419	200	219				208	99	109
Cass Lake and Winnibigoshish Reservation (Chippewa)	514	261	253	468	245	223	16	8	8	30	8	22
Fond du Lac Reservation (Chippewa)	1,298	689	609	706	387	319	2	2		590	300	290
Grand Portage Reservation (Chippewa)	377	162	215	269	124	145				108	38	70
Leech Lake Reservation (Chippewa)	891	453	438	797	411	386	45	18	27	49	24	25
White Earth Reservation (Chippewa)	8,059	4,008	4,051	5,398	2,787	2,611	304	148	156	2,357	1,073	1,284
White Oak Point Reservation (Chippewa)	558	300	258	495	267	228	1	1		62	32	30
Purchased Lands (Chippewa)	356	180	176	323	162	161				33	18	15
Pipestone School Jurisdiction and Purchased Lands (Sioux)	552	278	274	148	75	73	1		1	403	203	200
Red Lake Agency and Reservation (Chippewa)	1,968	1,014	954	1,817	939	878	29	12	17	122	63	59
Mississippi: Choctaw Agency and Purchased Lands (Choctaw)	1,792	902	890	1,784	897	887	8	5	3			
Montana	15,255	7,793	7,462	13,038	6,741	6,297	436	231	205	1,781	821	960
Blackfeet Agency and Reservation	3,962	2,031	1,931	3,401	1,765	1,636	36	19	17	525	247	278
Assiniboin	1		1	1		1						
Blackfeet	3,571	1,843	1,728	3,065	1,598	1,467	24	13	11	482	232	250
Blackfeet-Assiniboin	5	4	1	5	4	1						
Blackfeet-Bannock	4	3	1	4	3	1						
Blackfeet-Blood	12	5	7	7	3	4				5	2	3
Blackfeet-Cherokee	7	3	4	7	3	4						
Blackfeet-Chippewa	17	9	8	13	8	5				4	1	3
Blackfeet-Cree	256	128	128	241	121	120	1		1	14	7	7
Blackfeet-Cree-Assiniboin	2		2				2		2			
Blackfeet-Crow	3	3		3	3							
Blackfeet-Flathead	13	7	6	4	1	3	3	3		6	3	3
Blackfeet-Gros Ventre	21	6	15	17	4	13	4	2	2			
Blackfeet-Mission	2	2		2	2							
Blackfeet-Nez Perce	2	1	1				2	1	1			
Blackfeet-Oneida	5	1	4	5	1	4						
Blackfeet-Piegan	14	7	7	12	7	5				2		2
Blackfeet-Sioux	9	4	5	8	3	5				1	1	
Blackfeet-Tenino (Warm Springs)	3	2	1	3	2	1						
Cherokee	6	1	5							6	1	5
Chippewa	3		3	1		1				2		2
Cree	4		4	1		1				3		3
Gros-Ventre	1	1		1	1							
Shoshone	1	1		1	1							

Crow Agency and Reservation (Crow)	**2,082**	**1,053**	**1,029**	**1,863**	**949**	**914**	**31**	**9**	**22**	**188**	**95**	**93**
Flathead Agency and Reservation (Flathead)	**2,964**	**1,514**	**1,450**	**2,269**	**1,199**	**1,070**	**96**	**56**	**40**	**599**	**259**	**340**
Fort Belknap Agency and Reservation	**1,367**	**715**	**652**	**1,246**	**652**	**594**	**29**	**19**	**10**	**92**	**44**	**48**
Assiniboin	455	244	211	418	223	195	7	4	3	30	17	13
Assiniboin-Blackfeet	2	1	1	2	1	1						
Assiniboin-Cheyenne	1		1	1		1						
Assiniboin-Chippewa	2	2		2	2							
Assiniboin-Cree	33	16	17	33	16	17						
Assiniboin-Cree-Sioux	3	2	1	3	2	1						
Assiniboin-Gros Ventre	65	30	35	64	29	35				1	1	
Assiniboin-Gros Ventre-Crow	1		1	1		1						
Assiniboin-Nez Perce	19	6	13	19	6	13						
Assiniboin-Nez Perce-Cree	4	1	3	3	1	2				1		1
Assiniboin-Nez Perce-Gros Ventre	7	1	6	7	1	6						
Assiniboin-Nez Perce-Sioux	3	1	2	2		2				1	1	
Assiniboin-Osage	1	1								1	1	
Assiniboin-Seneca	6	3	3	6	3	3						
Assiniboin-Seneca-Gros Ventre	1		1	1		1						
Assiniboin-Shoshone-Bannock	4	3	1	4	3	1						
Assiniboin-Sioux	37	24	13	34	22	12	3	2	1			
Assiniboin-Sioux-Gros Ventre	2	1	1	2	1	1						
Assiniboin-Washo	1		1							1		1
Gros Ventre	430	217	213	385	195	190	6	5	1	39	17	22
Gros Ventre-Arapaho	43	23	20	36	21	15	5	2	3	2		2
Gros Ventre-Arapaho-Assiniboin	5	3	2	5	3	2						
Gros Ventre-Arapaho-Crow	1	1		1	1							
Gros Ventre-Arapaho-Sioux	10	2	8	10	2	8						
Gros Ventre-Assiniboin	121	64	57	116	60	56	3	2	1	2	2	
Gros Ventre-Assiniboin-Arapaho	11	7	4	11	7	4						
Gros Ventre-Assiniboin-Cree	5	3	2	5	3	2						
Gros Ventre-Assiniboin-Sioux	1		1	1		1						
Gros Ventre-Blackfeet	6	4	2	3	2	1	3	2	1			
Gros Ventre-Cheyenne	4	2	2	4	2	2						
Gros Ventre-Chippewa	2	2		2	2							
Gros Ventre-Chippewa-Cree	1	1		1	1							
Gros Ventre-Cree	30	16	14	17	11	6				13	5	8
Gros Ventre-Crow	10	6	4	10	6	4						
Gros Ventre-Piegan	8	7	1	8	7	1						
Gros Ventre-Piegan-Assiniboin	4	2	2	4	2	2						
Gros Ventre-Puyallup	1		1							1		1
Gros Ventre-Sioux	20	14	6	18	12	6	2	2				
Gros Ventre-Tlingit	3	2	1	3	2	1						
Piegan	1	1		1	1							
Piegan-Cree	3	2	1	3	2	1						
Fort Peck Agency and Reservation	**2,663**	**1,330**	**1,333**	**2,266**	**1,143**	**1,123**	**135**	**68**	**67**	**262**	**119**	**143**
Assiniboin	1,227	615	612	1,016	516	500	56	31	25	155	68	87
Assiniboin-Sioux	234	127	107	225	125	100	4	1	3	5	1	4
Sioux	1,202	588	614	1,025	502	523	75	36	39	102	50	52

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Montana—Continued.												
Rocky Boys' Agency and Reservation	**676**	**357**	**319**	**537**	**286**	**251**	**45**	**25**	**20**	**94**	**46**	**48**
Assiniboin-Blackfeet	1	1		1	1							
Blackfeet	3	2	1	3	2	1						
Blackfeet-Cree	19	15	4	16	13	3				3	2	1
Blackfeet-Cree-Assiniboin	4	1	3	4	1	3						
Blackfeet-Cree-Chippewa	7	3	4	1		1				6	3	3
Chippewa	95	51	44	60	35	25	8	5	3	27	11	16
Chippewa-Assiniboin	21	12	9	21	12	9						
Chippewa-Assiniboin-Sioux	7	6	1	2	2		3	3		2	1	1
Chippewa-Blackfeet	5	4	1	4	3	1				1	1	
Chippewa-Blackfeet-Assiniboin	6	3	3	6	3	3						
Chippewa-Cree	242	115	127	188	89	99	20	9	11	34	17	17
Chippewa-Cree-Arapaho	1	1		1	1							
Chippewa-Cree-Arapaho-Assiniboin	3		3	3		3						
Chippewa-Cree-Assiniboin	33	20	13	31	19	12	1	1		1		1
Chippewa-Cree-Assiniboin-Piegan	1	1		1	1							
Chippewa-Cree-Blackfeet	15	11	4	15	11	4						
Chippewa-Cree-Blackfeet-Piegan	6	3	3	2		2				4	3	1
Chippewa-Cree-Piegan	6	1	5	6	1	5						
Chippewa-Cree-Sioux	3	2	1	3	2	1						
Chippewa-Sioux	7	2	5	4	2	2	3		3			
Cree	50	29	21	41	23	18	2	1	1	7	5	2
Cree-Assiniboin	45	21	24	44	21	23				1		1
Cree-Assiniboin-Blackfeet	13	7	6	13	7	6						
Cree-Assiniboin-Blackfeet-Chippewa	3	3		3	3							
Cree-Assiniboin-Piegan	5	2	3	3	1	2	1	1		1		1
Cree-Blackfeet	5	4	1	5	4	1						
Cree-Blackfeet-Assiniboin-Piegan	1		1	1		1						
Cree-Chippewa	41	19	22	28	11	17	7	5	2	6	3	3
Cree-Chippewa-Assiniboin	5	3	2	5	3	2						
Cree-Chippewa-Blackfeet	10	5	5	10	5	5						
Cree-Piegan	2		2	1		1				1		1
Piegan-Chippewa-Assiniboin	6	6		6	6							
Piegan-Chippewa-Assiniboin-Cree	3	3		3	3							
Piegan-Chippewa-Cree	2	1	1	2	1	1						
Tongue River Agency and Reservation	**1,541**	**793**	**748**	**1,456**	**747**	**709**	**64**	**35**	**29**	**21**	**11**	**10**
Cheyenne	1,491	764	727	1,418	726	692	52	27	25	21	11	10
Cheyenne-Arapaho	2	1	1				2	1	1			
Cheyenne-Arikara	6	2	4	6	2	4						
Cheyenne-Chippewa	2	1	1	2	1	1						
Cheyenne-Cree	9	4	5	9	4	5						

Cheyenne-Crow	4	3	1	4	3	1						
Cheyenne-Kiowa	1	1					1	1				
Cheyenne-Sioux	24	15	9	15	9	6	9	6	3			
Sioux	2	2		2	2							
Nebraska [11]	**4,498**	**2,327**	**2,171**	**3,138**	**1,602**	**1,536**	**330**	**176**	**154**	**1,030**	**549**	**481**
Winnebago Agency [11]	**4,498**	**2,327**	**2,171**	**3,138**	**1,602**	**1,536**	**330**	**176**	**154**	**1,030**	**549**	**481**
Omaha Reservation	**1,642**	**868**	**774**	**1,366**	**716**	**650**	**30**	**16**	**14**	**246**	**136**	**110**
Omaha	1,576	833	743	1,302	681	621	30	16	14	244	136	108
Omaha-Bannock	6	3	3	6	3	3						
Omaha-Chippewa	2		2							2		2
Omaha-Iowa	7	4	3	7	4	3						
Omaha-Ponca	27	12	15	27	12	15						
Omaha-Potawatomi	5	2	3	5	2	3						
Omaha-Santee	2		2	2		2						
Omaha-Seneca	7	6	1	7	6	1						
Omaha-Sioux	7	5	2	7	5	2						
Omaha-Winnebago	3	3		3	3							
Ponca Reservation (Ponca) [11]	**392**	**189**	**203**	**194**	**94**	**100**	**9**	**3**	**6**	**189**	**92**	**97**
Santee Reservation (Santee) [9] [11]	**1,277**	**659**	**618**	**718**	**357**	**361**	**213**	**113**	**100**	**346**	**189**	**157**
Winnebago Reservation	**1,187**	**611**	**576**	**860**	**435**	**425**	**78**	**44**	**34**	**249**	**132**	**117**
Winnebago	1,164	602	562	843	430	413	77	43	34	244	129	115
Winnebago-Chippewa	1	1					1	1				
Winnebago-Kickapoo	4		4	4		4						
Winnebago-Omaha	12	4	8	10	3	7				2	1	1
Winnebago-Sac and Fox	2	1	1	2	1	1						
Winnebago-Sioux	4	3	1	1	1					3	2	1
Nevada	**5,076**	**2,531**	**2,545**	**4,865**	**2,433**	**2,432**	**184**	**85**	**99**	**27**	**13**	**14**
Carson School Jurisdiction [12]	**2,640**	**1,283**	**1,357**	**2,571**	**1,255**	**1,316**	**66**	**25**	**41**	**3**	**3**	
Fort McDermitt Reservation (Paiute)	**273**	**126**	**147**	**251**	**120**	**131**	**22**	**6**	**16**			
Pyramid Lake Reservation [12]	**549**	**272**	**277**	**549**	**272**	**277**						
Paiute	543	270	273	543	270	273						
Paiute-Washo	3	2	1	3	2	1						
Shoshone	2		2	2		2						
Washo	1		1	1		1						
Summit Lake Reservation (Paiute)	**64**	**34**	**30**	**64**	**34**	**30**						
Public Domain	**1,754**	**851**	**903**	**1,707**	**829**	**878**	**44**	**19**	**25**	**3**	**3**	
Eel River	1		1	1		1						
Paiute	261	113	148	258	111	147	2	1	1	1	1	
Paiute-Shoshone	4	2	2	4	2	2						
Shoshone	924	442	482	922	442	480	2		2			
Washo	537	279	258	496	260	236	39	17	22	2	2	
Washo-Klamath	1	1					1	1				
Washo-Maidu	4	1	3	4	1	3						
Washo-Oneida	2	1	1	2	1	1						
Washo-Paiute	18	11	7	18	11	7						
Washo-Sioux	2	1	1	2	1	1						
Paiute Agency, in Utah	**198**	**98**	**100**	**185**	**93**	**92**				**13**	**5**	**8**
Moapa River Reservation (Paiute)	**158**	**80**	**78**	**148**	**76**	**72**				**10**	**4**	**6**
Las Vegas Tract (Paiute)	**40**	**18**	**22**	**37**	**17**	**20**				**3**	**1**	**2**

For footnotes see p. 155

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nevada—Continued.												
Walker River Agency, see California	**1,722**	**878**	**844**	**1,673**	**854**	**819**	**45**	**22**	**23**	**4**	**2**	**2**
Fallon Reservation	**426**	**217**	**209**	**412**	**210**	**202**	**12**	**6**	**6**	**2**	**1**	**1**
Paiute	421	215	206	407	208	199	12	6	6	2	1	1
Paiute-Shoshone	1	1		1	1							
Shoshone	4	1	3	4	1	3						
Mason and Smith Valleys	**440**	**227**	**213**	**422**	**219**	**203**	**18**	**8**	**10**			
Maidu	1	1		1	1							
Paiute	427	218	209	409	210	199	18	8	10			
Paiute-Maidu	2	1	1	2	1	1						
Paiute-Washo	2	2		2	2							
Washo	8	5	3	8	5	3						
Nye County scattered Indians	**364**	**184**	**180**	**364**	**184**	**180**						
Paiute	29	16	13	29	16	13						
Shoshone	335	168	167	335	168	167						
Walker River Reservation	**492**	**250**	**242**	**475**	**241**	**234**	**15**	**8**	**7**	**2**	**1**	**1**
Paiute	445	226	219	428	217	211	15	8	7	2	1	1
Shoshone	47	24	23	47	24	23						
Western Shoshone Agency and Reservation, see Idaho	**516**	**272**	**244**	**436**	**231**	**205**	**73**	**38**	**35**	**7**	**3**	**4**
Hopi	1		1							1		1
Hopi-Shoshone-Paiute	8	5	3	3	3		1		1	4	2	2
Paiute	84	48	36	79	44	35	5	4	1			
Paiute-Maidu	1	1					1	1				
Shoshone	246	130	116	201	106	95	43	23	20	2	1	1
Shoshone-Paiute	175	87	88	153	78	75	22	9	13			
Shoshone-Washo	1	1					1	1				
New Mexico	**34,726**	**17,983**	**16,743**	**34,155**	**17,674**	**16,481**	**112**	**49**	**63**	**459**	**260**	**196**
Eastern Navajo Agency and Navajo Reservation (Navajo) [13]	**8,239**	**4,109**	**4,130**	**8,239**	**4,109**	**4,130**						
Jicarilla Agency and Reservation	**680**	**346**	**334**	**671**	**339**	**332**	**7**	**6**	**1**	**2**	**1**	**1**
Apache	649	329	320	643	325	318	4	3	1	2	1	1
Apache-Navajo	14	7	7	14	7	7						
Apache-Pueblo	17	10	7	14	7	7	3	3				
Mescalero Agency and Reservation	**722**	**356**	**366**	**706**	**342**	**364**	**5**	**4**	**1**	**11**	**10**	**1**
Apache	712	352	360	697	338	359	4	4				
Apache-Mexican	4	3	1	4	3	1						
Apache-Navajo	4	1	3	4	1	3						
Apache-Pima	1		1				1		1			
Pueblo-Mexican	1		1	1		1						

Northern Navajo Agency and Navajo Reservation (Navajo)	8,502	4,436	4,066	8,499	4,433	4,066	3	3				
Santa Fe School Jurisdiction	2,209	1,130	1,079	2,097	1,080	1,017	58	19	39	54	31	23
Nambe Pueblo (Pueblo)	128	62	66	120	58	62	4	2	2	4	2	2
Picuris Pueblo (Pueblo)	117	56	61	111	54	57	2		2	4	2	2
Pojoaque Pueblo (Pueblo)	9	5	4	6	3	3				3	2	1
San Ildefonso Pueblo (Pueblo)	126	68	58	111	62	49	9	2	7	6	4	2
Santa Juan Pueblo (Pueblo)	561	284	277	525	268	257	22	7	15	14	9	5
Santa Clara Pueblo	400	201	199	378	187	191	13	6	7	9	8	1
Pueblo	389	195	194	368	181	187	12	6	6	9	8	1
Pueblo-Apache	8	4	4	7	4	3	1		1			
Pueblo-Navajo	3	2	1	3	2	1						
Taos Pueblo (Pueblo)	745	389	356	724	384	340	8	2	6	13	3	10
Tesuque Pueblo (Pueblo)	123	65	58	122	64	58				1	1	
Southern Navajo Agency and Navajo Reservation, in Arizona (Navajo) [13]	4,821	2,402	2,419	4,817	2,399	2,418	2	2		2	1	1
Southern Pueblos Agency	7,502	4,043	3,459	7,106	3,836	3,270	26	6	20	370	201	169
Acoma Pueblo	1,125	577	548	1,065	543	522				60	34	26
Pueblo	1,120	575	545	1,063	543	520				57	32	25
Pueblo-Choctaw	1	1								1	1	
Pueblo-Navajo	4	1	3	2		2				2	1	1
Cochiti Pueblo	305	164	141	303	163	140				2	1	1
Pueblo	303	163	140	301	162	139				2	1	1
Pueblo-Hopi	2	1	1	2	1	1						
Isleta Pueblo	1,103	602	501	1,078	585	493				25	17	8
Navajo-Pueblo	2	2								2	2	
Pueblo	1,100	599	501	1,078	585	493				22	14	8
Pueblo-Navajo	1	1								1	1	
Jemez Pueblo (Pueblo)	677	366	311	673	364	309				4	2	2
Laguna Pueblo	2,271	1,188	1,083	1,987	1,048	939	25	6	19	259	134	125
Pueblo	2,211	1,157	1,054	1,944	1,025	919	22	6	16	245	126	119
Pueblo-Apache	16	8	8	9	5	4				7	3	4
Pueblo-Chippewa	6	2	4	6	2	4						
Pueblo-Hopi	3	1	2	2	1	1	1		1			
Pueblo-Kickapoo	1		1				1		1			
Pueblo-Maidu	2	2		2	2							
Pueblo-Mission	7	3	4	7	3	4						
Pueblo-Navajo	20	12	8	17	10	7	1		1	2	2	
Pueblo-Paiute	1		1							1		1
Pueblo-Papago	2	2								2	2	
Pueblo-Seneca-Mohawk	2	1	1							2	1	1
Sandia Pueblo (Pueblo)	129	69	60	118	62	56				11	7	4
San Felipe Pueblo	596	330	266	589	326	263	1		1	6	4	2
Pueblo	593	328	265	586	324	262	1		1	6	4	2
Pueblo-Cherokee	2	1	1	2	1	1						
Pueblo-Papago	1	1		1	1							
Santa Ana Pueblo (Pueblo)	241	146	95	241	146	95						
Santa Domingo Pueblo (Pueblo)	866	496	370	866	496	370						
Sia Pueblo (Pueblo)	189	105	84	186	103	83				3	2	1

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
New Mexico—Continued.												
Zuni Agency and Pueblo	2,051	1,161	890	2,020	1,136	884	11	9	2	20	16	4
Hopi	1		1	1		1						
Klamath	1		1				1		1			
Navajo	4		4	4		4						
Pima	2		2	1		1				1		1
Pueblo	2,043	1,161	882	2,014	1,136	878	10	9	1	19	16	3
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	3,254	1,724	1,530	2,400	1,280	1,120				854	444	410
North Dakota	10,287	5,218	5,069	6,642	3,390	3,252	173	91	82	3,472	1,737	1,735
Fort Berthold Agency and Reservation	1,569	769	800	1,508	739	769	16	10	6	45	20	25
Arikara	514	249	265	485	238	247	4	1	3	25	10	15
Arikara-Cheyenne	1		1				1		1			
Arikara-Chippewa	11	6	5	11	6	5						
Arikara-Gros Ventre	18	2	16	18	2	16						
Arikara-Gros Ventre-Mandan	2	1	1	2	1	1						
Arikara-Mandan	2	2		2	2							
Arikara-Navajo	1		1	1		1						
Arikara-Oneida	1		1	1		1						
Arikara-Sioux	8	5	3	8	5	3						
Gros Ventre	645	316	329	630	307	323	2	2		13	7	6
Gros Ventre-Arapaho	1		1							1		1
Gros Ventre-Chippewa	10	7	3	10	7	3						
Gros Ventre-Mandan	16	8	8	16	8	8						
Gros Ventre-Sioux	13	7	6	11	6	5	2	1	1			
Gros Ventre-Winnebago	2	1	1							2	1	1
Mandan	280	141	139	274	138	136	2	1	1	4	2	2
Mandan-Arikara	3	2	1	3	2	1						
Mandan-Chinook	1	1		1	1							
Mandan-Chippewa	1		1	1		1						
Mandan-Gros Ventre	22	9	13	22	9	13						
Mandan-Sioux	16	11	5	11	6	5	5	5				
Mandan-Unknown tribe	1	1		1	1							
Fort Totten Agency and Devils Lake Reservation (Sioux)	960	496	464	878	456	422	37	18	19	45	22	23
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	47	29	18	47	29	18						
Standing Rock Agency and Reservation, see South Dakota (Sioux)	1,677	833	844	1,549	773	776	44	20	24	84	40	44
Turtle Mountain Agency and Reservation (Chippewa)	6,034	3,091	2,943	2,660	1,393	1,267	76	43	33	3,298	1,655	1,643

Oklahoma	22,354	11,226	11,128	16,604	8,379	8,225	685	336	349	5,065	2,511	2,554
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)	2,760	1,423	1,337	2,443	1,247	1,196	134	70	64	183	106	77
Kiowa Agency	5,953	2,899	3,054	5,816	2,829	2,987	28	18	10	109	52	57
Kiowa Reservation	4,543	2,222	2,321	4,485	2,194	2,291	13	6	7	45	22	23
Apache	301	162	139	299	160	139	1	1		1	1	
Apache-Comanche	2	1	1	2	1	1						
Apache-Kiowa	14	7	7	14	7	7						
Comanche	2,035	997	1,038	2,008	986	1,022	3		3	24	11	13
Comanche-Apache	16	9	7	16	9	7						
Comanche-Caddo	8	5	3	8	5	3						
Comanche-Kiowa	36	17	19	36	17	19						
Kiowa	2,083	1,003	1,080	2,054	988	1,066	9	5	4	20	10	10
Kiowa-Apache	20	10	10	20	10	10						
Kiowa-Cheyenne	4	2	2	4	2	2						
Kiowa-Comanche	24	9	15	24	9	15						
Wichita Reservation	1,410	677	733	1,331	635	696	15	12	3	64	30	34
Caddo	799	391	408	736	358	378	10	8	2	53	25	28
Caddo-Delaware	107	52	55	107	52	55						
Caddo-Wichita	5	2	3	5	2	3						
Delaware	114	51	63	114	51	63						
Delaware-Caddo	24	13	11	24	13	11						
Delaware-Shawnee	3	1	2	3	1	2						
Wichita	350	164	186	334	155	179	5	4	1	11	5	6
Wichita-Caddo	3	1	2	3	1	2						
Wichita-Creek	1	1		1	1							
Wichita-Delaware	2	1	1	2	1	1						
Wichita-Kiowa	1		1	1		1						
Wichita-Otoe	1		1	1		1						
Osage Agency and Reservation	3,560	1,821	1,739	1,977	1,045	932	5	2	3	1,578	774	804
Osage	3,382	1,736	1,646	1,835	977	858	4	2	2	1,543	757	786
Osage-Bannock	7	5	2							7	5	2
Osage-Blackfeet	2		2	2		2						
Osage-Cayuga	4	2	2	2	1	1				2	1	1
Osage-Cherokee	24	8	16	17	5	12				7	3	4
Osage-Cheyenne	6	3	3	4	2	2				2	1	1
Osage-Chippewa-Wyandotte	4	2	2							4	2	2
Osage-Creek	2	1	1	1	1					1		1
Osage-Delaware	2	1	1	2	1	1						
Osage-Iowa	1	1		1	1							
Osage-Kaw	4	3	1	4	3	1						
Osage-Navajo	3		3	3		3						
Osage-Omaha	15	6	9	13	6	7				2		2
Osage-Omaha-Sac and Fox	2		2							2		2
Osage-Oneida	2	2		2	2							
Osage-Otoe	7	3	4	6	2	4				1	1	
Osage-Pawnee	2	1	1	2	1	1						
Osage-Peoria	1	1								1	1	
Osage-Ponca	5	4	1	5	4	1						
Osage-Potawatomi	21	9	12	21	9	12						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Osage Agency and Reservation—Continued.												
Osage-Pueblo	19	12	7	17	10	7				2	2	
Osage-Quapaw	15	9	6	13	9	4	1		1	1		1
Osage-Quapaw-Munsee	2		2	2		2						
Osage-Sac and Fox	2		2	2		2						
Osage-Seneca	3	2	1	3	2	1						
Osage-Shawnee	3	3		3	3							
Osage-Sioux	19	7	12	16	6	10				3	1	2
Osage-Wyandotte	1		1	1		1						
Pawnee Agency	2,981	1,506	1,475	2,355	1,202	1,153	196	98	98	430	206	224
Kaw Reservation	507	265	242	289	154	135	44	21	23	174	90	84
Kaw	366	194	172	197	106	91	35	20	15	134	68	66
Kaw-Cherokee	6	4	2	2	2					4	2	2
Kaw-Cheyenne	2	1	1	1		1				1	1	
Kaw-Chickasaw	2	1	1							2	1	1
Kaw-Creek	1		1							1		1
Kaw-Oneida	8	3	5	6	3	3				2		2
Kaw-Osage	9	3	6	8	3	5	1		1			
Kaw-Osage-Potawatomi	2	2								2	2	
Kaw-Ponca	3	3		3	3							
Kaw-Potawatomi	97	47	50	67	35	32	8	1	7	22	11	11
Kaw-Potawatomi-Cherokee	5	3	2	4	2	2				1	1	
Kaw-Shawnee	6	4	2	1		1				5	4	1
Oakland Reservation	46	25	21	35	19	16	4	3	1	7	3	4
Tonkawa	22	11	11	19	9	10	2	2		1		1
Tonkawa-Kiowa	1		1	1		1						
Tonkawa-Ponca	6	4	2	6	4	2						
Tonkawa-Potawatomi	1		1	1		1						
Tonkawa-Quapaw	2	1	1				2	1	1			
Tonkawa-Seminole	9	4	5	3	1	2				6	3	3
Tonkawa-Shawnee	5	5		5	5							
Otoe Reservation	722	370	352	551	282	269	67	34	33	104	54	50
Otoe	490	256	234	373	198	175	35	20	15	82	38	44
Otoe-Caddo	2	1	1	1		1	1	1				
Otoe-Cherokee	3	1	2	3	1	2						
Otoe-Chippewa	13	5	8	13	5	8						
Otoe-Iowa	116	55	61	95	45	50	13	5	8	8	5	3
Otoe-Iowa-Chickasaw	4	1	3	4	1	3						
Otoe-Iowa-Delaware	1		1				1		1			
Otoe-Iowa-Osage	5	4	1				5	4	1			
Otoe-Kaw	14	8	6	10	5	5				4	3	1

Otoe-Kaw-Osage	1		1	1		1						
Otoe-Kickapoo	4	3	1							4	3	1
Otoe-Munsee	6	5	1	6	5	1						
Otoe-Osage	7	4	3	1	1		6	3	3			
Otoe-Pawnee	6	5	1	3	2	1				3	3	
Otoe-Pawnee-Creek	1	1								1	1	
Otoe-Pawnee-Wyandotte	2	1	1							2	1	1
Otoe-Ponca	29	15	14	29	15	14						
Otoe-Potawatomi	4	1	3	1		1	3	1	2			
Otoe-Sac and Fox	12	4	8	9	4	5	3		3			
Otoe-Sioux	2		2	2		2						
Pawnee Reservation	**906**	**450**	**456**	**733**	**376**	**357**	**43**	**19**	**24**	**130**	**55**	**75**
Pawnee	705	361	344	607	316	291	28	16	12	70	29	41
Pawnee-Arapahoe	5	3	2	5	3	2						
Pawnee-Caddo	8	2	6				7	2	5	1		1
Pawnee-Cherokee	11	5	6	5	2	3				6	3	3
Pawnee-Cherokee-Delaware	4	2	2							4	2	2
Pawnee-Cheyenne	12	7	5	9	6	3				3	1	2
Pawnee-Cheyenne-Otoe	2		2	2		2						
Pawnee-Chickasaw	5	4	1	5	4	1						
Pawnee-Chippewa	5	2	3	4	2	2				1		1
Pawnee-Choctaw	20	8	12	7	4	3				13	4	9
Pawnee-Comanche	2	1	1	2	1	1						
Pawnee-Creek	11	5	6							11	5	6
Pawhee-Delaware	4	1	3							4	1	3
Pawnee Flathead	1	1								1	1	
Pawnee-Kaw	2	1	1							2	1	1
Pawnee-Kiowa	2	2		2	2							
Pawnee-Kiowa-Caddo	1	1		1	1							
Pawnee-Mojave	6	3	3							6	3	3
Pawnee-Oneida	1		1	1		1						
Pawnee-Osage	8	1	7				8	1	7			
Pawnee-Otoe	32	15	17	32	15	17						
Pawnee-Otoe-Iowa	1		1	1		1						
Pawnee-Otoe-Sac and Fox	4	1	3	4	1	3						
Pawnee-Otoe-Sioux	2		2	2		2						
Pawnee-Pima	1	1								1	1	
Pawnee-Ponca	2		2	2		2						
Pawnee-Potawatomi	19	8	11	19	8	11						
Pawnee-Pueblo	9	3	6	7	2	5				2	1	1
Pawnee-Quapaw	3	2	1	3	2	1						
Pawnee-Sac and Fox	1	1								1	1	
Pawnee-Seminole	1	1		1	1							
Pawnee-Shawnee	3	2	1	3	2	1						
Pawnee-Shawnee-Sioux	1	1		1	1							
Pawnee-Sioux	5	1	4	5	1	4						
Pawnee-Wichita	3	2	1	3	2	1						
Pawnee-Wyandotte	3	2	1							3	2	1
Pawnee-Yuma-Choctaw	1		1							1		1

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Pawnee Agency—Continued.												
Ponca Reservation	800	396	404	747	371	376	38	21	17	15	4	11
Ponca	735	359	376	702	343	359	25	13	12	8	3	5
Ponca-Cherokee	1	1		1	1							
Ponca-Chippewa	2	2		2	2							
Ponca-Creek	2	1	1	2	1	1						
Ponca-Delaware	1	1		1	1							
Ponca-Kaw	6	4	2	5	4	1				1		1
Ponca-Kiowa	1		1	1		1						
Ponca-Omaha	19	10	9	16	9	7	3	1	2			
Ponca-Osage	5	3	2				5	3	2			
Ponca-Otoe	9	5	4	7	4	3	2	1	1			
Ponca-Potawatomi	4	3	1	4	3	1						
Ponca-Seneca	6	1	5							6	1	5
Ponca-Shawnee	1	1					1	1				
Ponca-Sioux	2	2					2	2				
Ponca-Tonkawa	6	3	3	6	3	3						
Quapaw Agency	2,576	1,264	1,312	1,411	704	707	235	110	125	930	450	480
Eastern Shawnee Reservation (Shawnee)	262	122	140	166	81	85	25	14	11	71	27	44
Ottawa Reservation (Ottawa)	388	204	184	216	111	105	7	4	3	165	89	76
Quapaw Reservation (Quapaw)	528	252	276	325	157	168	16	9	7	187	86	101
Seneca Reservation (Seneca)	697	345	352	398	194	204	120	54	66	179	97	82
Wyandotte Reservation (Wyandotte)	701	341	360	306	161	145	67	29	38	328	151	177
Shawnee Agency	4,524	2,313	2,211	2,602	1,352	1,250	87	38	49	1,835	923	912
Iowa Reservation (Iowa)	108	52	56	107	52	55				1		1
Kickapoo Reservation (Kickapoo)	258	139	119	249	134	115				9	5	4
Potawatomi Reservation (Potawatomi)	2,714	1,386	1,328	954	492	462	59	26	33	1,701	868	833
Sac and Fox Reservation (Sac and Fox)	831	416	415	714	373	341	14	5	9	103	38	65
Shawnee Reservation (Shawnee)	613	320	293	578	301	277	14	7	7	21	12	9
Oregon	4,644	2,266	2,378	3,428	1,720	1,708	343	179	164	873	367	506
Klamath Agency and Reservation	1,364	661	703	1,065	535	530	51	28	23	248	98	150
Klamath	401	194	207	304	160	144	1		1	96	34	62
Klamath-Choctaw	4	2	2	4	2	2						
Klamath-Cree	1	1								1	1	
Klamath-Iroquois	1		1	1		1						
Klamath-Klikitat	1	1		1	1							
Klamath-Klikitat-Puyallup-Pit River	1	1		1	1							
Klamath-Kusa	6	5	1	6	5	1						
Klamath-Modoc	193	98	95	186	98	88				7		7
Klamath-Modoc-Cherokee	2		2	2		2						
Klamath-Modoc-Molala	12	4	8	12	4	8						

Klamath-Modoc-Pit River	44	19	25	43	18	25				1	1	
Klamath-Modoc-Pit River-Hoopa	1		1	1		1						
Klamath-Modoc-Seminole	1		1							1		1
Klamath-Modoc-Shoshone	1		1	1		1						
Klamath-Modoc-Wasco-Tenino (Warm Springs)	2		2				2		2			
Klamath-Molala	21	12	9	17	10	7				4	2	2
Klamath-Molala-Wasco	2	1	1	2	1	1						
Klamath-Paiute	12	4	8	9	3	6				3	1	2
Klamath-Pima-Papago	7	4	3							7	4	3
Klamath-Pit River-Hoopa	1	1		1	1							
Klamath-Pit River-Karok	2	1	1	2	1	1						
Klamath-Pit River-Paiute	5	1	4	5	1	4						
Klamath-Rogue River	13	5	8	1	1		1	1		11	3	8
Klamath-Rogue River-Modoc	2	2		2	2							
Klamath-Shasta	27	10	17	27	10	17						
Klamath-Shasta-Pit River	1		1	1		1						
Klamath-Sioux	1	1		1	1							
Klamath-Tenino (Warm Springs)	10	6	4	2	1	1				8	5	3
Klamath-Umpqua	1	1		1	1							
Klamath-Umpqua-Pit River	2	1	1	2	1	1						
Klamath-Wasco	9	6	3	6	3	3	3	3				
Klamath-Wasco-Chippewa	1		1	1		1						
Klamath-Yakima	4	1	3	1		1				3	1	2
Klamath-Yaqui	3		3	3		3						
Klamath-Yaqui-Pit River	1		1	1		1						
Modoc	203	97	106	138	65	73	16	10	6	49	22	27
Modoc-Cherokee	3	1	2				3	1	2			
Modoc-Karok	7	4	3	2	2		1		1	4	2	2
Modoc-Karok-Paiute	1		1				1		1			
Modoc-Karok-Pit River	1		1	1		1						
Modoc-Karok-Washo	3	3		3	3							
Modoc-Miwok	1	1		1	1							
Modoc-Molala	1		1	1		1						
Modoc-Paiute	47	21	26	45	21	24				2		2
Modoc-Peoria	2	1	1							2	1	1
Modoc-Pit River	35	14	21	32	12	20	1		1	2	2	
Modoc-Quapaw	2	1	1				2	1	1			
Modoc-Rogue River	7	4	3	7	4	3						
Modoc-Seneca	1		1							1		1
Modoc-Tenino (Warm Springs)	2	2					2	2				
Modoc-Wyandotte	1		1				1		1			
Paiute	91	49	42	69	37	32	17	10	7	5	2	3
Paiute-Klamath-Cherokee	6	3	3	1	1					5	2	3
Paiute-Miwok	9	7	2	9	7	2						
Paiute-Modoc-Klamath	33	14	19	30	13	17				3	1	2
Paiute-Wasco	1		1	1		1						
Pit River	18	10	8	13	9	4				5	1	4
Pit River-Klamath	36	18	18	30	16	14				6	2	4
Pit-River-Klamath-Rogue River	1		1	1		1						
Pit River-Modoc-Hoopa	15	7	8							15	7	8

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Klamath Agency and Reservation—Con.												
Pit River-Modoc-Klamath-Molala	5	1	4	5	1	4						
Pit River-Modoc-Paiute	2		2	2		2						
Pit River-Paiute	3	1	2	3	1	2						
Pit River-Paiute-Klamath-Modoc	24	16	8	24	16	8						
Shasta	7	4	3							7	4	3
Salem School Jurisdiction	**1,148**	**595**	**553**	**841**	**452**	**389**	**75**	**43**	**32**	**232**	**100**	**132**
Grand Ronde Reservation	**356**	**189**	**167**	**210**	**119**	**91**	**39**	**24**	**15**	**107**	**46**	**61**
Calapooya	26	15	11	23	14	9	2	1	1	1		1
Calapooya-Upper Chinook	5	4	1	3	3					2	1	1
Clackamas	56	27	29	24	14	10	10	6	4	22	7	15
Clackamas-Rogue River	14	7	7	14	7	7						
Clackamas-Rogue River-Santiam	4	3	1	4	3	1						
Clackamas-Santiam	10	3	7	6	1	5				4	2	2
Clowwewalla	1	1					1	1				
Iroquois	2	1	1							2	1	1
Lakmiut	4	3	1	1	1		3	2	1			
Mary's River	23	15	8	17	12	5	1		1	5	3	2
Mary's River-Shasta	4	2	2	4	2	2						
Molala	5	2	3	1		1				4	2	2
Rogue River	40	24	16	20	11	9	8	5	3	12	8	4
Rogue River-Santiam-Umpqua	3	1	2	3	1	2						
Rogue River-Shasta	11	8	3	11	8	3						
Rogue River-Upper Chinook	3	1	2							3	1	2
Santiam	13	8	5	4	2	2	4	2	2	5	4	1
Santiam-Rogue River	5	1	4	5	1	4						
Santiam-Tulatin	3		3							3		3
Santiam-Umpqua	12	7	5	8	4	4	2	2		2	1	1
Shasta	17	11	6	8	4	4	3	3		6	4	2
Shasta-Santiam	1		1							1		1
Shasta-Umpqua	5	2	3	4	2	2				1		1
Umpqua	56	25	31	32	15	17	2	1	1	22	9	13
Umpqua-Galice Creek	1		1	1		1						
Umpqua-Rogue River	3	2	1	2	2					1		1
Upper Chinook	8	3	5	5	2	3	1		1	2	1	1
Wapato	17	10	7	8	8		2	1	1	7	1	6
Wapato-Umpqua	2	2		2	2							
Wasco	2	1	1							2	1	1
Siletz Reservation	**465**	**234**	**231**	**339**	**175**	**164**	**28**	**12**	**16**	**98**	**47**	**51**
Alsea	8	5	3	5	2	3	1	1		2	2	
Calapooya	10	4	6	5	3	2	4		4	1	1	4

Chastacosta	27	9	18	22	8	14				5	1	4
Chastacosta-Cowlitz	4	2	2	4	2	2						
Chetco	11	5	6	8	3	5				3	2	1
Chetco-Klamath	1	1		1	1							
Chetco-Klikitat	6	4	2	6	4	2						
Coquille	8	5	3	6	3	3				2	2	
Dakubetede	13	6	7	12	5	7				1	1	
Dakubetede-Walla Walla	1		1							1		1
Galice Creek	22	11	11	19	10	9	2	1	1	1		1
Galice Creek-Umpqua	14	6	8	5	2	3	9	4	5			
Galice Creek-Wapato	2	2								2	2	
Galice Creek-Yuchi	4	2	2	4	2	2						
Joshua	21	10	11	8	5	3	2	2		11	3	8
Joshua-Chetco	13	8	5	1	1					12	7	5
Joshua-Clatsop	5	1	4							5	1	4
Joshua-Dakubetede	1		1	1		1						
Joshua-Piegan	2	2					2	2				
Joshua-Smith River	1	1								1	1	
Klamath	48	31	17	35	24	11				13	7	6
Klamath-Cowlitz	1	1		1	1							
Klamath-Rogue River	2	1	1	2	1	1						
Klikitat	3	1	2	1		1	1		1	1	1	
Kusa	9	4	5	7	4	3				2		2
Kusa-Chastacosta	3	2	1	3	2	1						
Kwatami	9	6	3	7	6	1				2		2
Kwatami-Umpqua	9	4	5	9	4	5						
Meguenodon	35	21	14	21	13	8				14	8	6
Meguenodon-Hoopa	7	2	5	7	2	5						
Meguenodon-Kusa	2	1	1	2	1	1						
Meguenodon-Shasta	7		7	7		7						
Meguenodon-Yuchi	2	2		2	2							
Naltunnetunne	5	3	2	5	3	2						
Naltunnetunne-Kusa	3	1	2	3	1	2						
Rogue River	49	27	22	42	22	20	1	1		6	4	2
Salmon River	1	1		1	1							
Salmon River-Meguenodon	2	2		2	2							
Shasta	2	1	1	2	1	1						
Shasta-Chastacosta	8	6	2	8	6	2						
Smith River	4	2	2				1	1		3	1	2
Tillamook	1		1	1		1						
Tututni	43	16	27	35	15	20	5		5	3	1	2
Tututunne-Chetco	7	3	4	7	3	4						
Umpqua	15	7	8	11	5	6				4	2	2
Yaquina	2	2		2	2							
Yaquina-Alsea	4	2	2	4	2	2						
Yuchi	6	1	5	5	1	4				1		1
Unknown	2		2							2		2

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Salem School Jurisdiction—Continued.												
Fourth Section Allottees (Public Domain)	**327**	**172**	**155**	**292**	**158**	**134**	**8**	**7**	**1**	**27**	**7**	**20**
Calapooya	5	4	1	5	4	1						
Cherokee	18	12	6	18	12	6						
Cowlitz	1	1		1	1							
Cowlitz-Klamath	4	2	2	4	2	2						
Klamath	51	25	26	39	20	19	3	3		9	2	7
Kusa	57	26	31	55	24	31	1	1		1	1	
Mission	1		1	1		1						
Rogue River	68	37	31	65	37	28				3		3
Rogue River-Mission	3	1	2	3	1	2						
Siuslaw	10	7	3	10	7	3						
Spokane	4	3	1	4	3	1						
Tututni	17	6	11	7	3	4				10	3	7
Tututni-Kusa	1	1		1	1							
Umpqua	43	25	18	37	21	16	3	3		3	1	2
Upper Chinook	1	1		1	1							
Unknown	43	21	22	41	21	20	1		1	1		1
Umatilla Agency and Reservation	**1,140**	**532**	**608**	**660**	**322**	**338**	**140**	**68**	**72**	**340**	**142**	**198**
Cayuse	122	50	72	88	38	50	11	7	4	23	5	18
Cayuse-Colville	13	6	7	13	6	7						
Cayuse-Colville-Nez Perce	1		1	1		1						
Cayuse-Colville-Paloos	1	1					1	1				
Cayuse-Colville-Tenino (Warm Springs)	1		1	1		1						
Cayuse-Flathead	1	1					1	1				
Cayuse-Nez Perce	38	18	20	22	11	11	15	7	8	1		1
Cayuse-Nez Perce-Cree	3	2	1	3	2	1						
Cayuse-Nez Perce-Flathead	2	1	1				2	1	1			
Cayuse-Nez Perce-Makah	1		1	1		1						
Cayuse-Nez Perce-Yakima	5	5		5	5							
Cayuse-Umatilla	32	15	17	27	12	15	3	2	1	2	1	1
Cayuse-Umatilla-Nez Perce	22	10	12	11	6	5	7	2	5	4	2	2
Cayuse-Umatilla-Nez-Perce-Sac and Fox	3	1	2							3	1	2
Cayuse-Umatilla-Walla Walla	12	7	5	8	5	3	1		1	3	2	1
Cayuse-Umatilla-Walla Walla-Nez-Perce	7	5	2	6	5	1				1		1
Cayuse-Umatilla-Walla Walla-Paloos	4	1	3	4	1	3						
Cayuse-Umatilla-Yakima	1	1		1	1							
Cayuse-Walla Walla	52	25	27	46	23	23	3		3	3	2	1
Cayuse-Walla Walla-Colville	4	1	3	4	1	3						
Cayuse-Walla Walla-Nez Perce	4		4	1		1	3		3			

Cayuse-Walla Walla-Nez Perce-Colville	3	1	2	3	1	2						
Cayuse-Walla Walla-Yakima	1		1							1		1
Cayuse-Wasco-Tenino (Warm Springs)	1	1								1	1	
Cayuse-Yakima	30	11	19	25	11	14	5		5			
Nez Perce	13	4	9	11	4	7	2		2			
Paloos	4	1	3	4	1	3						
Tenino (Warm Springs)	1	1								1	1	
Umatilla	74	26	48	50	18	32	6	4	2	18	4	14
Umatilla-Colville-Yakima	1		1	1		1						
Umatilla-Klikitat	4	2	2	1	1		3	1	2			
Umatilla-Nez Perce	25	10	15	22	9	13	3	1	2			
Umatilla-Paloos	1		1	1		1						
Umatilla-Paloos-Yakima	1	1		1	1							
Umatilla-Tenino (Warm Springs)	3	2	1							3	2	1
Umatilla-Yakima	15	7	8	14	6	8	1	1				
Walla Walla	527	262	265	227	124	103	50	29	21	250	109	141
Walla Walla-Calapooya	2	2								2	2	
Walla Walla-Cherokee	3	1	2	3	1	2						
Walla Walla-Colville	29	15	14	7	6	1	12	6	6	10	3	7
Walla Walla-Colville-Paloos	1		1	1		1						
Walla Walla-Flathead	4	3	1				1	1		3	2	1
Walla Walla-Klikitat	3	1	2							3	1	2
Walla Walla Nez Perce	4	3	1	2	2		2	1	1			
Walla Walla-Nez-Perce-Flathead	1		1							1		1
Walla Walla-Paloos	8	4	4	7	4	3	1		1			
Walla Walla-Sioux	5	3	2	5	3	2						
Walla Walla-Umatilla	23	11	12	15	7	8	1		1	7	4	3
Walla Walla-Umatilla-Yakima	1	1					1	1				
Walla Walla-Yakima	22	9	13	18	7	11	4	2	2			
Yakima	1		1				1		1			
Warm Springs Agency and Reservation	**992**	**478**	**514**	**862**	**411**	**451**	**77**	**40**	**37**	**53**	**27**	**26**
Cowlitz	2	1	1				2	1	1			
Klamath-Pit River-Wasco	5	2	3				5	2	3			
Klikitat	25	10	15	24	10	14	1		1			
Klikitat-Yakima	1	1					1	1				
Paiute	197	107	90	155	81	74	36	21	15	6	5	1
Paiute-Blackfeet	1		1	1		1						
Paiute-Tenino (Warm Springs)	7	3	4	6	3	3	1		1			
Paiute-Wasco	8	5	3	4	3	1	4	2	2			
Paiute-Yakima	4	3	1	4	3	1						
Pit River	1	1		1	1							
Pit River-Puyallup	9	5	4	4	3	1	1		1	4	2	2
Pit River-Puyallup-Hoopa	3	1	2	3	1	2						
Pit River-Puyallup-Paiute	6	4	2	6	4	2						
Pit River-Wasco	2		2	2		2						
Pit River-Wasco-Shasta	3	1	2	3	1	2						
Pit River-Yakima	2	2		2	2							
Puyallup	1	1								1	1	
Puyallup-Wasco-Pit River	4	1	3	4	1	3						
Tenino (Warm Springs)	439	187	252	410	175	235	13	7	6	16	5	11
Tenino-(Warm Springs) Blood	1		1	1		1						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Warm Springs Agency and Reservations—Continued.												
Tenino-(Warm Springs) Klamath	1	1		1	1							
Tenino-(Warm Springs) Klikitat	1		1	1		1						
Tenino-(Warm Springs) Nez Perce-Wasco	2	2		2	2							
Tenino-(Warm Springs) Siletz	1	1		1	1							
Tenino-(Warm Springs) Umatilla	6	4	2	4	3	1	2	1	1			
Tenino-(Warm Springs) Upper Chinook	4	4		4	4							
Tenino-(Warm Springs) Wasco-Paiute	5	4	1	5	4	1						
Tenino-(Warm Springs) Wasco-Yakima	10	3	7	10	3	7						
Tenino-(Warm Springs) Yakima	14	7	7	14	7	7						
Tenino-(Warm Springs) Yakima-Klikitat	1		1	1		1						
Upper Chinook	4	2	2	4.	2	2						
Wasco	94	45	49	73	35	38	7	3	4	14	7	7
Wasco-Puyallup	7	6	1							7	6	1
Wasco-Tenino (Warm Springs)	97	48	49	91	45	46	3	2	1	3	1	2
Wasco-Tenino-(Warm Springs) Klamath	1	1		1	1							
Wasco-Tenino-(Warm Springs) Umatilla	4	3	1	4	3	1						
Wasco-Tenino-(Warm Springs) Upper Chinook	3	3		3	3							
Wasco-Umatilla	1	1		1	1							
Wasco-Upper Chinook	2	1	1	1	1		1		1			
Wasco-Yakima	5	3	2	3	3					2		2
Yakima	6	3	3	6	3	3						
Unknown	2	1	1	2	1	1						
South Dakota	**26,695**	**13,682**	**13,013**	**23,177**	**11,940**	**11,237**	**998**	**485**	**513**	**2,520**	**1,257**	**1,263**
Cheyenne River Agency and Reservation	**3,288**	**1,713**	**1,575**	**2,780**	**1,458**	**1,322**	**245**	**129**	**116**	**263**	**126**	**137**
Sioux	3,266	1,699	1,567	2,763	1,449	1,314	240	124	116	263	126	137
Sioux-Chippewa	14	6	8	14	6	8						
Sioux-Choctaw	2	2		2	2							
Sioux-Creek	1	1		1	1							
Sioux-Shawnee	4	4					4	4				
Sioux-Yuma	1	1					1	1				
Crow Creek Agency	**1,556**	**785**	**771**	**1,229**	**621**	**608**	**145**	**57**	**88**	**182**	**107**	**75**
Crow Creek Reservation (Sioux)	**953**	**464**	**489**	**805**	**391**	**414**	**65**	**21**	**44**	**83**	**52**	**31**
Lower Brule Reservation (Sioux)	**603**	**321**	**282**	**424**	**230**	**194**	**80**	**36**	**44**	**99**	**55**	**44**
Flandreau School Jurisdiction and Purchased Lands (Sioux)	**345**	**186**	**159**	**169**	**98**	**71**	**40**	**21**	**19**	**136**	**67**	**69**
Pine Ridge Agency and Reservation	**8,370**	**4,303**	**4,067**	**7,844**	**4,060**	**3,784**	**93**	**42**	**51**	**433**	**201**	**232**
Sioux	8,245	4,241	4,004	7,767	4,020	3,747	83	37	46	395	184	211
Sioux-Arapaho	7	2	5	5	2	3				2		2

Sioux-Cherokee	22	12	10	18	10	8				4	2	2
Sioux-Cheyenne	21	11	10	10	4	6	2	1	1	9	6	3
Sioux-Chippewa	6	3	3	6	3	3						
Sioux-Crow	11	6	5	4	3	1	7	3	4			
Sioux-Hopi	3	1	2							3	1	2
Sioux-Iroquois	2	1	1	2	1	1						
Sioux-Menominee	3	2	1	3	2	1						
Sioux-Nez Perce	1		1							1		1
Sioux-Omaha	2	1	1	2	1	1						
Sioux-Oneida	19	11	8	12	7	5				7	4	3
Sioux-Osage	8	3	5	3	1	2	1	1		4	1	3
Sioux-Ponca	6	3	3	6	3	3						
Sioux-Potawatomi	1		1	1		1						
Sioux-Walapai	5	1	4							5	1	4
Sioux-Wichita	2		2	2		2						
Sioux-Winnebago	4	4		3	3					1	1	
Sioux-Unknown tribe	2	1	1							2	1	1
Rosebud Agency [11]	8,380	4,268	4,112	7,474	3,821	3,653	245	117	128	661	330	331
Rosebud Reservation (Sioux)	6,362	3,255	3,107	5,997	3,055	2,942	87	47	40	278	153	125
Yankton Reservation (Sioux)	2,018	1,013	1,005	1,477	766	711	158	70	88	383	177	206
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)	2,658	1,368	1,290	1,854	972	882	142	71	71	662	325	337
Standing Rock Agency and Reservation, in North Dakota (Sioux)	2,098	1,059	1,039	1,827	910	917	88	48	40	183	101	82
Utah [2]	2,124	1,101	1,023	1,965	1,019	946	48	28	20	111	54	57
Consolidated Ute Agency, in Colorado, and Public Domain Allottments (Ute)	43	26	17	43	26	17						
Fort Hall Agency, in Idaho, and Washakie Subagency (Shoshone)	137	64	73	112	52	60	21	12	9	4		4
Paiute Agency, see Arizona and Nevada	382	188	194	319	155	164	3	1	2	60	32	28
Goshute Reservation	155	81	74	145	73	72	2	1	1	8	7	1
Goshute	153	81	72	143	73	70	2	1	1	8	7	1
Goshute-Shoshone	2		2	2		2						
Kanosh Reservation	24	9	15	22	7	15				2	2	
Paiute	1		1	1		1						
Ute	17	7	10	15	5	10				2	2	
Ute-Paiute	6	2	4	6	2	4						
Koosharem Reservation (Ute)	30	14	16	29	14	15				1		1
Paiute Reservation (Paiute)	19	11	8	13	8	5				6	3	3
Shivwits Reservation (Paiute)	79	37	42	71	36	35				8	1	7
Skull Valley Reservation (Goshute)	41	18	23	39	17	22	1		1	1	1	
Gandy (Homestead) (Paiute)	6	4	2							6	4	2
Cedar City (Church property) (Paiute)	28	14	14							28	14	14
Uintah and Ouray Agency and Reservation (Ute)	1,251	660	591	1,180	623	557	24	15	9	47	22	25
Western Navajo Agency, in Arizona, and Western Navajo Reservation [2]	311	163	148	311	163	148						
Navajo	307	160	147	307	160	147						
Paiute	4	3	1	4	3	1						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington	**12,907**	**6,401**	**6,506**	**9,135**	**4,586**	**4,549**	**220**	**86**	**134**	**3,552**	**1,729**	**1,823**
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation	**88**	**47**	**41**	**86**	**47**	**39**	**2**		**2**			
Kalispel	64	31	33	62	31	31	2		2			
Kalispel-Coeur d'Alene	3	3		3	3							
Kalispel-Flathead	11	7	4	11	7	4						
Kalispel-Spokane	10	6	4	10	6	4						
Colville Agency	**3,925**	**1,956**	**1,969**	**3,163**	**1,625**	**1,538**	**144**	**56**	**88**	**618**	**275**	**343**
Colville Reservation (Colville)	**3,118**	**1,577**	**1,541**	**2,564**	**1,327**	**1,237**	**88**	**33**	**55**	**466**	**217**	**249**
Spokane Reservation	**807**	**379**	**428**	**599**	**298**	**301**	**56**	**23**	**33**	**152**	**58**	**94**
Spokane	754	351	403	560	275	285	43	19	24	151	57	94
Spokane-Coeur d'Alene	29	16	13	20	13	7	9	3	6			
Spokane-Colville	18	10	8	17	9	8				1	1	
Spokane-Flathead	3	2	1	1	1		2	1	1			
Spokane-Kalispel	2		2				2		2			
Spokane-Nez Perce	1		1	1		1						
Taholah Agency [14]	**2,452**	**1,245**	**1,207**	**1,407**	**739**	**668**	**19**	**10**	**9**	**1,026**	**496**	**530**
Chehalis Reservation (Chehalis)	**29**	**22**	**7**	**20**	**17**	**3**				**9**	**5**	**4**
Makah Reservation [14]	**403**	**216**	**187**	**339**	**185**	**154**	**2**		**2**	**62**	**31**	**31**
Makah	370	197	173	310	169	141	2		2	58	28	30
Makah-Clallam	20	12	8	16	9	7				4	3	1
Makah-Lummi	6	4	2	6	4	2						
Makah-Pueblo	1	1		1	1							
Makah-Rogue River	3	1	2	3	1	2						
Makah-Snohomish	3	1	2	3	1	2						
Nisqually Reservation (Nisqually)	**63**	**36**	**27**	**53**	**32**	**21**				**10**	**4**	**6**
Ozette Reservation (Makah) [14]	**2**	**2**		**2**	**2**							
Quinaielt Reservation	**1,727**	**855**	**872**	**801**	**403**	**398**	**12**	**8**	**4**	**914**	**444**	**470**
Chehalis	73	35	38	36	14	22				37	21	16
Chehalis-Cherokee	3	2	1							3	2	1
Chehalis-Cowlitz	1		1	1		1						
Chehalis-Dwamish-Yakima	3	3								3	3	
Chehalis-Nisqually	6	1	5	6	1	5						
Chehalis-Nisqually-Puyallup	7	4	3	7	4	3						
Chehalis-Puyallup	1		1	1		1						
Chehalis-Quinaielt	3	2	1							3	2	1
Chehalis-Skokomish	4	4		1	1					3	3	
Chehalis-Snohomish	4		4	1		1				3		3
Cowlitz	19	8	11	6	2	4				13	6	7
Dwamish-Snoqualmu	1		1	1		1						
Hoh	4	4		4	4							
Quileute	242	128	114	235	123	112	1	1		6	4	2

Quileute-Clallam	1	1		1	1							
Quileute-Makah	16	2	14	16	2	14						
Quileute-Puyallup	10	6	4							10	6	4
Quileute-Tulalip	2	1	1	2	1	1						
Quinaielt	841	415	426	403	204	199	6	4	2	432	207	225
Quinaielt-Chehalis	13	5	8	8	3	5				5	2	3
Quinaielt-Chehalis-Puyallup	8	7	1							8	7	1
Quinaielt-Clatsop	2		2							2		2
Quinaielt-Cowlitz	15	9	6	3	1	2	1	1		11	7	4
Quinaielt-Cowlitz-Dwamish	1		1				1		1			
Quinaielt-Cowlitz-Puyallup	2	1	1							2	1	1
Quinaielt-Dwamish-Yakima	2		2	2		2						
Quinaielt-Makah	8	3	5	4	2	2				4	1	3
Quinailet-Nisqually	3	1	2	2	1	1				1		1
Quinaielt-Paiute	3	2	1				3	2	1			
Quinaielt-Quileute	23	13	10	23	13	10						
Quinaielt-Skokomish	15	9	6	9	5	4				6	4	2
Quinaielt-Snoqualmu	3	2	1	3	2	1						
Quinaielt-Squaxin	6	3	3	3	1	2				3	2	1
Quinaielt-Upper Chinook	246	124	122	10	7	3				236	117	119
Quinaielt-Yakima	10	7	3	8	6	2				2	1	1
Upper Chinook	92	39	53	2	2					90	37	53
Upper Chinook-Chehalis	9	3	6							9	3	6
Upper Chinook-Chehalis-Quinaielt	3	1	2							3	1	2
Upper Chinook-Cowlitz	22	10	12	3	3					19	7	12
Skokomish Reservation	**189**	**94**	**95**	**163**	**85**	**78**	**4**	**1**	**3**	**22**	**8**	**14**
Clallam	1	1		1	1							
Skokomish	188	93	95	162	84	78	4	1	3	22	8	14
Squaxin Island Reservation (Squaxin)	**39**	**20**	**19**	**29**	**15**	**14**	**1**	**1**		**9**	**4**	**5**
Tulalip Agency	**3,500**	**1,766**	**1,734**	**2,068**	**1,040**	**1,028**	**12**	**3**	**9**	**1,420**	**723**	**697**
Lummi Reservation	**667**	**340**	**327**	**548**	**277**	**271**				**119**	**63**	**56**
Lummi	628	326	302	509	263	246				119	63	56
Lummi-Chippewa	8	4	4	8	4	4						
Lummi-Clallam	6	1	5	6	1	5						
Lummi-Colville	1		1	1		1						
Lummi-Nez Perce	3	3		3	3							
Lummi-Snohomish	12	2	10	12	2	10						
Lummi-Swinomish	6	3	3	6	3	3						
Lummi-Yakima	2	1	1	2	1	1						
Snohomish	1		1	1		1						
Muckleshoot Reservation	**200**	**89**	**111**	**191**	**85**	**106**	**3**	**1**	**2**	**6**	**3**	**3**
Muckleshoot	165	74	91	156	70	86	3	1	2	6	3	3
Muckleshoot-Clallam	1		1	1		1						
Muckleshoot-Puyallup	9	4	5	9	4	5						
Muckleshoot-Quinaielt	1		1	1		1						
Muckleshoot-Snohomish	1	1		1	1							
Muckleshoot-Suquamish	1	1		1	1							
Muckleshoot-Yakima	22	9	13	22	9	13						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington—Continued.												
Tulalip Ageney—Continued.												
Port Madison Reservation	**171**	**86**	**85**	**155**	**81**	**74**	**3**		**3**	**13**	**5**	**8**
Suquamish	148	77	71	132	72	60	3		3	13	5	8
Suquamish-Clallam	4	1	3	4	1	3						
Suquamish-Puyallup	17	7	10	17	7	10						
Suquamish-Snohomish	2	1	1	2	1	1						
Puyallup Reservation	**328**	**162**	**166**	**29**	**15**	**14**				**299**	**147**	**152**
Puyallup	301	148	153	24	13	11				277	135	142
Puyallup-Cowlitz	1		1							1		1
Puyallup-Muckleshoot	8	4	4							8	4	4
Puyallup-Quinaielt	1	1								1	1	
Puyallup-Skokomish	3	2	1							3	2	1
Puyallup-Snohomish	5	2	3	5	2	3						
Puyallup-Suquamish	3	1	2							3	1	2
Puyallup-Yakima	6	4	2							6	4	2
Swinomish Reservation	**273**	**130**	**143**	**268**	**127**	**141**				**5**	**3**	**2**
Muckleshoot	1		1	1		1						
Suquamish	1		1	1		1						
Swinomish	246	119	127	241	116	125				5	3	2
Swinomish-Clallam	2		2	2		2						
Swinomish-Lummi	4	1	3	4	1	3						
Swinomish-Muckleshoot	3	1	2	3	1	2						
Swinomish-Skagit	2		2	2		2						
Swinomish-Suquamish	4	4		4	4							
Swinomish-Suquamish-Muckleshoot	7	3	4	7	3	4						
Swinomish-Upper Chinook	3	2	1	3	2	1						
Tulalip Reservation and Tulalip unattached Indians	**663**	**322**	**341**	**457**	**223**	**234**	**2**		**2**	**204**	**99**	**105**
Clallam	4	3	1	4	3	1						
Skagit	2	1	1	2	1	1						
Snohomish	556	273	283	368	184	184	1		1	187	89	98
Snohomish-Clallam	21	9	12	15	5	10				6	4	2
Snohomish-Lummi	3	3								3	3	
Snohomish-Makah	1		1				1		1			
Snohomish-Nooksak	2	2		2	2							
Snohomish-Paiute	1	1		1	1							
Snohomish-Puyallup	6	2	4	6	2	4						
Snohomish-Puyallup-Suquamish	3	1	2	3	1	2						
Snohomish-Skagit	14	6	8	11	5	6				3	1	2
Snohomish-Skokomish	5	1	4	5	1	4						
Snohomish-Suquamish	17	8	9	12	6	6				5	2	3

Snohomish-Swinomish	6	3	3	6	3	3						
Snohomish-Yakima	19	8	11	19	8	11						
Suquamish	2	1	1	2	1	1						
Swinomish	1		1	1		1						
Public Domain (Clallam)	**758**	**396**	**362**	**2**	**2**					**756**	**394**	**362**
Clallam	741	390	351	2	2					739	388	351
Clallam-Lummi	2		2							2		2
Clallam-Makah	1	1								1	1	
Clallam-Puyallup	1		1							1		1
Clallam-Snohomish	4	2	2							4	2	2
Clallam-Suquamish	9	3	6							9	3	6
Public Domain (Nooksak)	**235**	**126**	**109**	**220**	**118**	**102**				**15**	**8**	**7**
Nooksak	230	125	105	215	117	98				15	8	7
Nooksak-Skagit	4		4	4		4						
Nooksak-Yakima	1	1		1	1							
Public Domain (Skagit)	**205**	**115**	**90**	**198**	**112**	**86**	**4**	**2**	**2**	**3**	**1**	**2**
Skagit	199	110	89	195	109	86	1		1	3	1	2
Skagit-Makah	3	2	1				3	2	1			
Skagit-Snohomish	3	3		3	3							
Yakima Agency and Reservation (Yakima)	**2,942**	**1,387**	**1,555**	**2,411**	**1,135**	**1,276**	**43**	**17**	**26**	**488**	**235**	**253**
Wisconsin [15]	**11,265**	**5,666**	**5,599**	**9,152**	**4,639**	**4,513**	**395**	**180**	**215**	**1,718**	**847**	**871**
Keshena Agency [15]	**5,205**	**2,629**	**2,576**	**4,211**	**2,170**	**2,041**	**185**	**77**	**108**	**809**	**382**	**427**
Menominee Reservation	**2,077**	**1,050**	**1,027**	**1,962**	**1,005**	**957**	**14**	**5**	**9**	**101**	**40**	**61**
Menominee	1,857	943	914	1,766	911	855	9	2	7	82	30	52
Menominee-Chippewa	49	24	25	45	23	22	3	1	2	1		1
Menominee-Creek	3	1	2	3	1	2						
Menominee-Oneida	40	23	17	40	23	17						
Menominee-Oneida-Chippewa	4	1	3	4	1	3						
Menominee-Ottawa	13	7	6	13	7	6						
Menominee-Ottawa-Potawatomi	4	2	2	4	2	2						
Menominee-Potawatomi	32	15	17	31	15	16				1		1
Menominee-Shawnee	1		1							1		1
Menominee-Sioux	5	1	4	5	1	4						
Menominee-Sioux-Winnebago	2	1	1	2	1	1						
Menominee-Stockbridge	49	24	25	35	14	21	2	2		12	8	4
Menominee-Winnebago	15	8	7	11	6	5				4	2	2
Menominee-Winnebago-Chippewa	2		2	2		2						
Menominee-Wyandotte	1		1	1		1						
Oneida Reservation	**3,128**	**1,579**	**1,549**	**2,249**	**1,165**	**1,084**	**171**	**72**	**99**	**708**	**342**	**366**
Oneida	2,992	1,518	1,474	2,187	1,140	1,047	137	55	82	668	323	345
Oneida-Brotherton	21	7	14	6		6				15	7	8
Oneida-Cherokee	2	1	1				2	1	1			
Oneida-Chippewa	36	19	17	9	6	3	10	5	5	17	8	9
Oneida-Choctaw	4	2	2				2	1	1	2	1	1
Oneida-Klamath	2	1	1				2	1	1			
Oneida-Menominee	6	4	2	6	4	2						
Oneida-Mohawk	5	3	2	5	3	2						
Oneida-Omaha	1		1				1		1			
Oneida-Pima	2	1	1				2	1	1			
Oneida-Ponca	1		1				1		1			

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Fenale	Total	Male	Female	Total	Male	Female	Total	Male	Female
Wisconsin—Continued.												
Kashena Agency—Continued.												
Oneida Reservation—Continued.												
Oneida-Pueblo	4	3	1							4	3	1
Oneida-Sioux	3	1	2				3	1	2			
Oneida-Stockbridge	36	12	24	36	12	24						
Oneida-Wyandotte	13	7	6				11	7	4	2		2
Lac du Flambeau Agency [15] [16]	4,652	2,346	2,306	3,750	1,880	1,870	73	44	29	829	422	407
Bad River Reservation (Chippewa)	1,211	629	582	732	385	347	24	15	9	455	229	226
Lac Courte Oreille Reservation (Chippewa) [16]	1,559	769	790	1,425	697	728	28	14	14	106	58	48
Lac du Flambeau Reservation (Chippewa)	853	401	452	741	347	394				112	54	58
Red Cliff Reservation (Chippewa)	606	318	288	452	237	215	6	4	2	148	77	71
Scattered bands	423	229	194	400	214	186	15	11	4	8	4	4
Potawatomi	388	217	171	365	202	163	15	11	4	8	4	4
Potawatomi-Chippewa	2		2	2		2						
Potawatomi-Menominee	10	2	8	10	2	8						
Potawatomi-Ottawa	10	6	4	10	6	4						
Potawatomi-Winnebago	13	4	9	13	4	9						
Tomah School Jurisdiction and Public Domain Allotments (Winnebago)	1,408	691	717	1,191	589	602	137	59	78	80	43	37
Wyoming	2,178	1,116	1,062	1,948	1,010	938	52	27	25	178	79	99
Shoshone Agency and Wind River or Shoshone Reservation	2,178	1,116	1,062	1,948	1,010	938	52	27	25	178	79	99
Arapaho	1,056	546	510	1,021	530	491	14	8	6	21	8	13
Arapaho-Gros Ventre	9	4	5	9	4	5						
Arapaho-Shoshone	4	2	2							4	2	2
Arapaho-Sioux	3	1	2	3	1	2						
Shoshone	1,049	529	520	882	456	426	33	16	17	134	57	77
Shoshone-Arapaho	10	6	4	7	4	3	1	1		2	1	1
Shoshone-Bannock	8	6	2	7	5	2	1	1				
Shoshone-Cherokee	1		1	1		1						
Shoshone-Comanche	3	2	1							3	2	1
Shoshone-Flathead	6	2	4	4	1	3	2	1	1			
Shoshone-Klamath	1		1				1		1			
Shoshone-Navajo	7	4	3							7	4	3
Shoshone-Paiute	4	3	1							4	3	1
Shoshone-Seminole-Wyandotte	3	2	1	3	2	1						

Shoshone-Ute	10	7	3	10	7	3						
Shoshone-Ute-Paiute	1		1	1		1						
Shoshone-Yakima	3	2	1							3	2	1

[1] See estimated statement of other Indians not enumerated, numbering 93,166.
[2] Formerly the entire population of Western Navajo Reservation was reported under Arizona; hence, the decrease in the population of that reservation in Arizona. The portion of the reservation lying in Utah is now shown under Utah.
[3] Formerly Fort McDowell and Salt River Reservations were under the jurisdiction of Phoenix School, but now under Pima; hence, the marked change in population.
[4] Formerly Gila Bend Reservation was under Pima Agency; but now under Sells Agency; hence, the unusual increase in Sells Agency.
[5] 177 Indians on Chui Chuischu Reservation, Pima Agency, transferred to Papago Reservation, Sells Agency.
[6] Apr. 1, 1933, population.
[7] Formerly Havasupai Reservation was a separate jurisdiction, but now under Truxton Canon Agency.
[8] Tulare County Indians prior to 1922 returned under Tule River Reservation.
[9] Apr. 1, 1930, population.
[10] Nez Perce Reservation formerly under Fort Lapwai Agency, but now under Coeur d'Alene Agency. Fort Lapwai Agency has been abolished.
[11] Formerly Ponca and Santee Reservations, Nebr. and Yankton Reservation, S.Dak., were under the jurisdiction of Yankton Agency, S. Dak. That agency has been abolished. and the two former reservations placed under the jurisdiction of Winnebago Agency and the latter under Rosebud Agency.
[12] Pyramid Lake Reservation formerly a separate jurisdiction; but now under Carson School Jurisdiction; hence the unusual increase.
[13] 292 Indians under Southern Navajo Agency, N.Mex. transferred to Eastern Navajo Agency, N.Mex.
[14] Makah and Ozette Reservations formerly under Neah Bay Agency, but now under Taholah Agency. Neah Bay Agency has been abolished.
[15] Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Lac du Flambeau Agency. (See estimated statement.)
[16] Lac Courte Oreille Reservation formerly under Hayward School Jurisdiction, but now under Lac du Flambeau Agency. Hayward School Jurisdiction has been abolished.

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Table 3.—Indian School Population and School Enrollment During Fiscal Year Ended June 30, 1934

NOTE.—A LARGE NUMBER OF THE INDIAN CHILDREN REPORTED IN COLUMN 11 ARE BELIEVED TO BE IN PUBLIC SCHOOLS AWAY FROM RESERVATIONS. COLUMN 12 INCLUDES INELIGIBLES

The total scholastic population of the Five Civilized Tribes is taken from the State enumeration and is not inclusive of all Indian children of the Five Civilized Tribes. The enrollment figures include children who are under 6 and over 18 years of age. The Indian pupils for the Five Tribes reported as in public schools include only those for whom tuition was paid, and do not include children enrolled in public schools in incorporated towns; these children are shown under column 11.

State and jurisdiction	Indian children 6 to 18, inclusive	Enrollment								Definite information not available	Not enrolled in any school	Under 6 and over 18, enrolled in all schools
		Total number	Local public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatoria			
1	2	3	4	5	6	7	8	9	10	11	12	13
Total	**102,440**	**76,264**	**45,678**	**7,474**	**9,167**	**5,429**	**1,986**	**6,117**	**413**	**11,553**	**14,623**	**5,335**
Arizona	**14,507**	**8,102**	**621,**	**2,333**	**2,057**	**1,331**	**792**	**939**	**29**	**1,518**	**4,887**	**1,204**
Colorado River:												
Chemehuevi	76	72	50	1	13	7			1		4	
Mohave	206	182	100	45	12	18		5	2	15	9	13
Fort Apache	838	706	21	89	415	1	130	49	1		132	90
Hopi:												
Hopi	775	752	43	483	3	209		14			23	486
Navajo	1,069	301	4		206	86		5		378	390	174
Kaibab (under Paiute)	24	19	2	12		5				1	4	4
Leupp	728	324	13		287	24				7	397	36
Phoenix: Camp Verde	108	69	40		3	26				39		2
Pima	1,667	1,183	27	688		182	141	145		484		85
Salt River	412	329	37	190		88		14			83	
San Carlos	748	529	18	235	64	8	157	41	6	11	208	27
Sells	1,601	1,018	56	311		124	364	163		583		54
Southern Navajo	4,422	1,922	200	140	700	386		502	12		2,500	181
Truxton Canon:												
Havasupai	53	52		37		15					1	1
Hualapai	130	120		26		94					10	4
Western Navajo:												
Hopi	105	105	5	76		24						
Navajo	1,545	419	5		354	52		1	7		1,126	47
California	**4,937**	**4,453**	**3,506**	**225**		**638**	**2**	**77**	**5**	**147**	**337**	**1,957**
Bishop (under Walker River Nev.)	449	346	279	7		58		2		75	28	
Fort Yuma	189	175	26	113		35			1		14	17
Hoopa Valley	1,221	1,131	907	77		141	2		4	3	87	18

Mission	740	654	513			88		53			86	
Sacramento	2,338	2,147	1,781	28		316		22		69	122	1,922
Colorado: Consolidated Ute	**215**	**184**	**70**		**97**	**15**		**2**			**31**	**3**
Florida: Seminole	**190**	**16**		**16**							**174**	**13**
Idaho	**1,063**	**895**	**505**		**182**	**23**		**133**	**52**		**168**	**80**
Coeur d'Alene	221	208	122			5		77	4		13	19
Nez Perce	370	322	236			3		36	47		48	41
Fort Hall	472	365	147		182	15		20	1		107	20
Iowa: Sac and Fox	**118**	**99**	**35**	**48**		**9**			**7**	**12**	**7**	**11**
Kansas	**573**	**467**	**397**			**70**				**45**	**61**	**478**
Sac and Fox	20	18	17			1				1	1	11
Potawatomi	248	187	133			54				26	35	232
Iowa	183	166	158			8					17	114
Kickapoo	122	96	89			7				18	8	121
Minnesota	**4,589**	**3,934**	**2,725**	**80**	**210**	**511**	**49**	**338**	**21**	**405**	**250**	**40**
Consolidated Chippewa	3,816	3,322	2,522	80		425	49	227	19	336	158	40
Pipestone	82	80	64			14			2		2	
Red Lake	691	532	139		210	72		111		69	90	
Mississippi: Choctaw	**384**	**372**		**372**							**12**	**20**
Montana	**4,787**	**4,210**	**3,004**	**271**	**377**	**140**	**127**	**266**	**25**	**105**	**472**	**80**
Blackfeet	1,271	1,048	739	44	174	30		47	14		223	
Crow	620	564	527			18	11	6	2		56	6
Flathead	978	829	634		7	36	49	103		10	139	32
Fort Belknap	436	405	253		[1] 88	7	57			29	2	
Fort Peck	826	809	[2] 730		21	22	10	18	8	1	16	36
Rocky Boys'	243	217	9	182		20		6		25	1	
Tongue River	413	338	112	45	87	7		86	1	40	35	6
Nebraska	**1,535**	**1,372**	**1,152**			**48**		**172**			**163**	
Winnebago:												
Winnebago	431	394	324			20		50			37	
Omaha	579	511	437			22		52			68	
Santee	378	339	279			1		59			39	
Ponca	147	128	112			5		11			19	
Nevada	**1,328**	**1,015**	**541**	**195**		**278**		**1**		**24**	**289**	**199**
Carson	545	432	278	41		113					113	45
Pyramid Lake	125	102	19	67		16					23	9
Moapa River (under Paiute, Utah)	41	34	22			12				3	4	2
Walker River:												
Fallon	110	88	21	36		31					22	
Walker River	117	87	6	47		34					30	
Mason-Smith Valleys	110	57	18	4		34		1		8	45	
Scattered Indians	97	72	62			10					25	
Western Shoshone	183	143	115			28				13	27	143
New Mexico	**9,304**	**4,797**	**143**	**1,556**	**1,393**	**751**	**322**	**494**	**138**	**24**	**4,483**	**334**
Eastern Navajo	2,812	894	42	23	583	107		139			1,918	29
Jicarilla	200	187	14			9		93	71	3	10	1
Mescalero	195	134	5	1	112	14		2			61	9
Northern Navajo	3,172	1,063	21	176	698	130		38			2,109	65
Northern Pueblos	633	606	4	410		134	6	52			27	57

[1] All pupils above third grade attend public school.
[2] 149 of these children were housed in the dormitory.

Table 3.—Indian School Population and School Enrollment During Fiscal Year Ended June 30, 1934—Continued

State and jurisdiction	Indian children 6 to 18, inclusive	Enrollment								Definite information not available	Not enrolled in any school	Under 6 and over 18, enrolled in all schools
		Total number	Local public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatoria			
1	2	3	4	5	6	7	8	9	10	11	12	13
New Mexico—Continued.												
Southern Pueblos	1,755	1,438	49	821	----------	296	105	167	----------	21	296	141
Zuni	537	475	8	125	----------	61	211	3	67	----------	62	32
North Carolina: Cherokee	**1,589**	**776**	**254**	**170**	**316**	**36**	----------	----------	----------	**395**	**418**	**75**
North Dakota	**3,384**	**2,471**	**790**	**691**	**335**	**211**	**63**	**378**	**3**	**472**	**441**	**116**
Fort Berthold	436	360	187	90	----------	18	----------	64	1	37	39	16
Fort Totten	259	196	36	----------	79	3	----------	78	----------	----------	63	13
Standing Rock	479	352	187	----------	81	16	63	3	2	39	88	17
Turtle Mountain	2,210	1,563	380	601	175	174	----------	233	----------	396	251	70
Oklahoma	**37,901**	**30,140**	**25,504**	**225**	**2,841**	**393**	**130**	**1,047**	----------	**7,198**	**563**	**319**
Cheyenne and Arapaho	665	491	310	----------	173	7	----------	1	----------	52	122	63
Kiowa	1,904	1,657	1,128	----------	435	94	----------	----------	----------	85	162	63
Osage	1,317	1,242	1,014	----------	----------	----------	130	98	----------	----------	75	71
Pawnee:												
Kaw	147	93	74	----------	14	5	----------	----------	----------	49	5	4
Pawnee	252	176	98	----------	68	10	----------	----------	----------	65	11	18
Ponca	264	203	129	----------	60	10	----------	4	----------	25	36	8
Otoe	248	177	96	----------	66	15	----------	----------	----------	51	20	9
Tonkawa	18	12	12	----------	----------	----------	----------	----------	----------	4	2	----------
Quapaw	898	588	485	----------	71	28	----------	4	----------	281	29	23
Shawnee	1,127	889	781	----------	5	18	----------	85	----------	137	101	60
Five Civilized Tribes	31,061	24,612	21,377	225	1,949	206	----------	855	----------	6,449	----------	----------
Cherokee Nation	14,638	10,335	9,074	141	828	74	----------	218	----------	4,303	----------	----------
Chickasaw Nation	3,087	2,658	2,418	30	186	16	----------	8	----------	429	----------	----------
Choctaw Nation	5,827	5,557	4,483	40	551	67	----------	416	----------	270	----------	----------
Creek Nation	6,670	5,223	4,656	14	[3] 363	45	----------	145	----------	1,447	----------	----------
Seminole Nation	839	839	746	----------	21	4	----------	68	----------	----------	----------	----------
Oregon	**1,153**	**946**	**645**	----------	**148**	**54**	**11**	**74**	**14**	**58**	**149**	**10**
Klamath	424	399	350	----------	----------	29	----------	20	----------	----------	25	----------
Salem:												
Siletz	132	118	109	----------	----------	7	1	----------	1	2	12	----------
Grande Ronde	94	80	64	----------	----------	7	----------	3	6	4	10	----------
Public Domain	9	1	----------	----------	----------	1	----------	----------	----------	8	----------	----------
Umatilla	252	172	103	----------	----------	2	10	51	6	44	36	10
Warm Springs	242	176	19	----------	148	8	----------	----------	1	----------	66	----------

South Dakota	**7,998**	**6,472**	**2,414**	**931**	**1,136**	**650**	**88**	**1,230**	**23**	**392**	**1,134**	**282**
Cheyenne River	899	832	378	75	236	74	----------	69	----------	11	56	----------
Crow Creek:												
Crow Creek	247	221	113	----------	4	36	----------	68	----------	16	10	21
Lower Brule	204	186	82	----------	25	23	----------	56	----------	6	12	7
Flandreau	100	82	48	----------	----------	30	3	1	----------	9	9	12
Pine Ridge	2,450	2,050	544	622	450	24	25	382	3	17	383	110
Rosebud	1,949	1,523	469	231	270	104	22	425	2	12	414	77
Yankton	747	463	241	3	16	95	38	68	2	243	41	----------
Sisseton	795	663	305	----------	----------	234	----------	115	9	14	118	34
Standing Rock	607	452	234	----------	135	30	----------	46	7	64	91	21
Utah	**468**	**377**	**154**	**105**	**64**	**53**	----------	**1**	----------	**17**	**74**	**2**
Uintah and Ouray	358	300	134	70	60	35	----------	1	----------	10	48	----------
Paiute:												
Goshute	34	32	----------	29	----------	3	----------	----------	----------	----------	2	----------
Shivwits	24	21	8	----------	----------	13	----------	----------	----------	1	2	1
Skull Valley	12	8	----------	6	----------	2	----------	----------	----------	2	2	----------
Scattered Bands	27	9	9	----------	----------	----------	----------	----------	----------	4	14	1
Allen Canyon (under Consolidated Ute)	13	7	3	----------	4	----------	----------	----------	----------	----------	6	----------
Washington	**3,439**	**2,810**	**2,458**	----------	**8**	**83**	**1**	**171**	**89**	**354**	**275**	**42**
Colville:												
Colville	918	768	653	----------	----------	8	----------	105	2	92	53	6
Spokane	269	245	227	----------	----------	----------	----------	12	6	3	2i	----------
Taholah	507	433	402	----------	----------	8	----------	6	17	11	63	9
Neah Bay	116	99	85	----------	----------	8	1	----------	5	6	11	2
Tulalip	1,049	854	753	----------	----------	33	----------	9	59	78	117	----------
Yakima	580	411	338	----------	8	26	----------	39	----------	164	5	25
Wisconsin	**2,305**	**1,811**	**613**	**136**	**3**	**122**	**401**	**529**	**7**	**319**	**175**	**57**
Hayward	418	368	232	3	----------	28	78	26	1	26	24	11
Keshena	563	544	35	21	----------	4	118	363	3	1	18	24
Lac du Flambeau:												
Lac du Flambeau	236	192	47	111	----------	27	----------	7	----------	9	35	8
Red Cliff	157	97	12	1	----------	8	75	1	----------	47	13	----------
Crandon	159	92	77	----------	3	8	----------	4	----------	67	----------	----------
Bad River	336	199	40	----------	----------	18	130	9	2	109	28	5
Tomah	436	319	170	----------	----------	29	----------	119	1	60	57	9
Wyoming	**673**	**545**	**147**	**120**	----------	**13**	----------	**265**	----------	**68**	**60**	**13**
Shoshone:												
Shoshone	332	266	118	112	----------	9	----------	27	----------	39	27	6
Arapaho	341	279	29	8	----------	4	----------	238	----------	29	33	7

[3] 107 of these children attend public school.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Total	**25,639**	**21,516**		
Arizona:				
Colorado River Agency:				
Colorado River	46	41	B-5	Day.
Fort Apache Agency:				
Fort Apache	376	368	2-10	Reservation, boarding.
Cibicue	54	46	B-3	Day.
Theodore Roosevelt	140	136	B-4	Nonreservation, boarding.
Hopi Agency:				
Hopi	176	73	B-7	Reservation, boarding.
Chimopovy	71	65	B-7	Day.
Hotevilla-Bacabi	124	116	B-8	Do.
Oraibi	78	169	B-7	Do.
Polacca	146	123	B-8	Do.
Second Mesa	73	60	B-7	Do.
Leupp Agency:				
Leupp	377	292	B-9	Reservation, boarding.
Phoenix School:				
Phoenix	641	572	7-12	Nonreservation, boarding.
Pima:				
Pima	314	257	B-9	Day.
Blackwater	43	33	B-2	Do.
Casa Blanca	122	106	B-5	Do.
Gila Crossing	60	56	B-5	Do.
Lehi	35	30	B-4	Do.
Maricopa	34	31	B-4	Do.
Salt River	155	133	B-6	Do.
Santan	124	109	B-4	Do.
San Carlos Agency:				
San Carlos	134	94	B-8	Reservation, boarding.
San Carlos	269	212	B-8	Day.
Sells Agency:				
Chui Chiuschu	26	13	B-4	Do.
Poso Redondo	37	15	B-5	Do.
Santa Rosa	146	109	B-4	Do.
Sells-Vamori	105	79	B-6	Do.
Ventena	56	41	B-4	Do.
Southern Navajo Agency:				
Chin Lee	136	133	B-4	Reservation, boarding.
Southern Navajo	391	351	B-6	Do.
Tohatchi	210	202	B-6	Do.
Cornfields	38	37	B-4	Day.
Crystal	34	31	1-3	Do.
Kinlichee	35	34	B-2	Do.
Klagetoh	33	31	1	Do.
Truxton Cañon School:				
Truxton Cañon	232	204	B-8	Reservation, boarding.
Havasupai	41	37	B-6	Day.
Peach Springs	26	25	B-6	Do.
Western Navajo Agency:				
Western Navajo	354	348	B-7	Reservation, boarding.
Moencopi	78	75	B-6	Day.
California:				
Fort Yuma Agency:				
Fort Yuma	156	113	B-6	Do.
Hoopa Valley Agency:				
Hoopa Valley	105	83	B-5	Do.
Sacramento Agency:				
Fort Bidwell	28	21	B-6	Do.
Sherman Institute	852	733	7-12	Nonreservation, boarding.
Colorado:				
Consolidated Ute Agency:				
Ignacio	226	214	B-8	Reservation, boarding.
Ute Mountain	169	156	B-7	Do.
Florida:				
Seminole Agency:				
Seminole	29	9	B-3	Day.
Idaho:				
Fort Hall Agency:				
Fort Hall	230	192	B-8	Reservation, boarding.
Iowa:				
Sac and Fox Agency:				
Mesquakie	49	37	B-3	Day.
Kansas:				
Haskell Agency:				
Haskell Institute	799	617	10-12	Nonreservation, boarding.
Kickapoo	23	22	B-6	Day.
Michigan:				
Mount Pleasant School	52	45	2-9	Nonreservation, boarding.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Minnesota:				
Consolidated Chippewa Agency:				
Pine Point	85	72	B–6	Day.
Pipestone School	308	302	B–9	Nonreservation, boarding.
Red Lake Agency:				
Cross Lake	103	100	B–7	Reservation, boarding.
Red Lake	130	105	B–9	Do.
Mississippi:				
Choctaw Agency:				
Bogue Chitto	39	30	B–3	Day.[1]
Bogue Homo	20	16	B–6	Do.[1]
Conehatta	59	47	B–5	Do.[1]
Pearl River	84	74	B–7	Do.[1]
Red Water	57	47	B–6	Do.[1]
Standing Pine	32	29	B–6	Do.[1]
Tucker	62	57	B–6	Do.[1]
Montana:				
Blackfeet Agency:				
Blackfeet	178	139	1–12	Reservation, boarding.
Heart Butte	60	28	B–3	Day.
Fort Belknap Agency:				
Fort Belknap	88	69	1–11	Reservation, boarding.
Fort Peck Agency:				
Fort Peck	149	115	B–12	Do.
Rocky Boys' Agency:				
Forest Camp	27	17	B–5	Day.
Haystack Butte	33	27	B–5	Do.
Parker Canyon	33	20	B–8	Do.
Rocky Boys'	52	36	B–7	Do.
Sangrey	37	26	B–7	Do.
Tongue River Agency:				
Tongue River	96	86	B–8	Reservation, boarding.
Birney	40	35	B–6	Day.
Muddy Creek	6	5	B–8	Do.
Nebraska:				
Genoa School	70	55	B–12	Nonreservation, boarding.
Nevada:				
Carson Agency:				
Carson	607	545	B–10	Do.
Fort McDermitt	40	35	B–6	Day.
Nevada	81	66	B–7	Do.
Walker River Agency:				
Fallon	38	28	B–3	Do.
Walker River	68	50	B–8	Do.
New Mexico:				
Albuquerque School	778	723	7–12	Nonreservation, boarding.
Charles H. Burke School	501	433	4–12	Do.
Eastern Navajo Agency:				
Eastern Navajo (Pueblo Bonito)	360	351	B–6	Reservation, boarding.
Pinedale	23	22	B–3	Day.
Mescalero Agency:				
Mescalero	124	116	B–6	Reservation, boarding.
Northern Navajo Agency:				
San Juan	409	401	B–8	Do.
Toadlena	245	215	B–7	Do.
Nava	60	52	B–5	Day.
Redrock	56	29	B–3	Do.
Sanostee	65	58	B–2	Do.[1]
Teecnospos	27	16	B	Do.
Santa Fe Agency:				
Santa Fe	530	467	3–12	Nonreservation, boarding.
Nambe	20	19	B–2	Day.
Picuris	28	24	B–4	Do.
San Ildefonso	20	17	B–5	Do.
San Juan	92	88	B–7	Do.
Santa Clara	69	62	B–6	Do.
Taos	176	171	B–8	Do.
Tesuque	21	13	B–5	Do.
Southern Pueblos Agency:				
Acomita	101	86	B–6	Do.
Chicale	20	23	B–6	Do.
Cochiti	45	43	B–6	Do.
Encinal	17	13	B–6	Do.
Isleta	116	100	B–6	Do.
Jemez Mission	32	30	1–2	Do.
Jemez	53	49	B–6	Do.
Laguna	50	47	B–6	Do.
McCartys	67	60	B–6	Do.
Mesita	19	16	B–5	Do.

[1] Figures taken from report for Dec. 30.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Southern Pueblo Agencys—Continued.				
Paguate	66	56	B-6	Day.
Paraje	40	37	B-6	Do.
Sandia	20	19	B-5	Do.
San Felipe	59	50	B-5	Do.
Santa Ana	29	26	B-7	Do.
Santa Domingo	113	99	B-6	Do.
Seama	26	24	B-6	Do.
Sia	21	20	B-5	Do.
Zuni Agency:				
Zuni	143	127	B-9	Do.
North Carolina:				
Cherokee Agency:				
Cherokee	316	286	B-10	Reservation, boarding.
Cherokee	90	72	B-8	Day.
Big Cove	33	26	B-5	Do.
Birdtown	63	48	B-5	Do.
North Dakota:				
Bismarck School	114	83	4-10	Nonreservation, boarding.
Fort Berthold Agency:				
Independence	31	20	B-7	Day.
Nishu	28	17	B-7	Do.
Shell Creek	49	31	B-6	Do.
Fort Totten School	228	195	1-9	Reservation, boarding.
Standing Rock Agency:				
Standing Rock	229	197	B-8	Do.
Turtle Mountain Agency:				
Turtle Mountain	727	423	1-8	Day.
Indian Day No. 5	87	52	1-6	Do.
Roussin	66	48	B-4	Do.
Wahpeton School	364	345	B-9	Nonreservation, boarding.
Oklahoma:				
Cheyenne and Arapaho Agency:				
Cheyenne and Arapaho	241	114	1-9	Reservation, boarding.
Chilocco School	841	670	7-12	Nonreservation, boarding.
Kiowa Agency:				
Fort Sill	211	183	1-9	Reservation, boarding.
Riverside	240	215	B-8	Do.
Pawnee Agency:				
Pawnee	260	213	1-8	Do.
Quapaw Agency:				
Seneca	274	259	1-9	Do.
Five Civilized Tribes Agency:				
Sequoyah Orphan Training School	365	339	1-12	Nonreservation, boarding.
Creek Nation:				
Euchee	131	111	1-9	Do.
Eufaula	155	149	B-9	Do.
Chickasaw Nation:				
Carter Seminary	190	159	1-9	Do.
Choctaw Nation:				
Jones Male Academy	213	178	B-9	Do.
Wheelock Academy	138	132	B-9	Do.
Oregon;				
Salem School	360	286	7-12	Do.
Warm Springs Agency:				
Warm Springs	147	136	B-8	Reservation, boarding.
South Dakota:				
Cheyenne River Agency:				
Cheyenne River	275	232	B-9	Do.
Cherry Creek	29	21	1-6	Day.
Green Grass	29	18	B-6	Do.
Thunder Butte	20	17	B-5	Do.
Flandreau School	504	452	10-12	Nonreservation, boarding.
Pierre School	325	290	B-10	Do.
Pine Ridge Agency:				
Pine Ridge (Oglala)	610	440	B-12	Reservation, boarding.
No. 4	25	19	B-6	Day.
No. 5	50	42	B-6	Do.
No. 6	28	16	1-5	Do.
No. 7	30	19	B-6	Do.
No. 9	39	22	B-6	Do.
No. 10	27	14	B-6	Do.
No. 12	16	11	B-5	Do.
No. 15	20	17	B-5	Do.
No. 16	39	26	B-6	Do.
No. 17	15	10	2-6	Do.
No. 20	27	21	B-6	Do.
No. 21	23	13	B-5	Do.
No. 22	27	18	B-6	Do.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
South Dakota—Continued.				
Pine Ridge Agency—Continued.				
No. 23	21	15	B–6	Day
No. 24	48	30	B–6	Do.
No. 25	21	15	B–6	Do.
No. 26	15	8	B–6	Do.
No. 27	28	20	B–6	Do.
No. 28	12	7	B–6	Do.
Red Shirt Table	19	11	B–6	Do.
Kyle	134	89	B–8	Do.
Wakpamni Lake	17	12	B–6	Do.
Rapid City School	58	57	-------	Nonreservation boarding.
Rosebud Agency:				
Rosebud	320	213	B–9	Reservation, boarding.
Blackpipe	32	18	B–5	Day.
Cut Meat	38	23	B–6	Do.
He Dog's Camp	28	25	B–6	Do.
Little Crow	31	27	B–6	Do.
Milk's Camp	30	21	B–6	Do.
Oak Creek	22	17	B–6	Do.
Spring Creek	34	22	B–6	Do.
Upper Cut Meat	17	12	1–6	Do.
Utah:				
Paiute Agency:				
Goshute	44	36	B–8	Do.
Kaibab	17	13	B–6	Do.
Uintah and Ouray Agency:				
Uintah	112	74	B–7	Reservation, boarding.
Uintah	44	19	B–7	Day.
Ouray	37	21	B–5	Do.
Wisconsin:				
Hayward School	45	30	1–9	Reservation, boarding.
Keshena Agency:				
Neopit	29	20	B–8	Day.
Lac du Flambeau Agency:				
Lac du Flambeau	142	109	1–9	Do.
Tomah School	240	190	1–10	Nonreservation, boarding.
Wyoming:				
Shoshone Agency:				
Shoshone	139	116	B–10	Day.

SCHOOL SUMMARY

Class	Number of schools	Enrollment	Average attendance
Nonreservation, boarding	25	9,276	8,069
Reservation, boarding	36	8,401	7,211
Day	134	8,063	6,288
Total	**195**	**25,740**	**21,568**

THE NATIONAL PARK SERVICE

ARNO B. CAMERER, Director

This year, for the first time in its history, the National Park Service goes on a fiscal-year basis in its annual report. Previously these reports covered primarily a seasonal year beginning October 1 and ending the following September 30, although of necessity financial matters were reported on a fiscal-year basis.

In making the transition, this report for 1934 covers financial matters for the entire fiscal year ended June 30, but construction, travel, and other activities previously covered on a travel-year basis, herein are reported for the period from October 1, 1933, to June 30, 1934, to avoid duplication of material in last year's report. The annual report of the National Park Service will be entirely on a fiscal-year basis.

The Federal campaign to make 1934 outstanding as a national-park year met with an enthusiastic response, with the result that travel to the scenic national parks increased 38 percent for the period October 1, 1933, to June 30, 1934, over the same period a year ago.

Following the Secretary's appeal to the American people last January to visit their national parks during 1934, the National Park Service entered into an intensive travel-promotion campaign. Although handicapped by the fact that no funds were available for advertising, and with printing funds so limited as to make impossible the issuance of an adequate quantity of printed informational matter, this campaign was a distinct success. This happy result was achieved through the whole-hearted cooperation of the operators of concessions in the national parks, railroads and other transportation systems, automobile associations, oil companies, chambers of commerce, civic organizations, and conservationists generally. The press supported the movement universally, and radio companies were exceedingly generous in donating free time for national-park broadcasts. Valuable assistance also was given whenever possible and consistent by various Federal emergency organizations.

Among the extraordinary activities of the National Park Service in promoting park travel in 1934 were the promotion of two national-park radio series and related talks; the sponsoring of a series of national-park stamps; the preparation of six national-park posters,

the first to be issued by the Department of the Interior; the issuance of thoroughly revamped information circulars; cooperation with emergency relief agencies in public works; and cooperation with outside agencies whereby much material was furnished for use in newspaper and magazine advertising.

In all of the above, and particularly in pushing the national-park stamp series project, the support and active cooperation of the Secretary of the Interior has been invaluable.

NATIONAL PARKS PARTICIPATION IN EMERGENCY ACTIVITIES

The National Park Service was fortunate in being one of those bureaus so situated that it was able, with a minimum of time, to enter actively into the various emergency measures destined by the President to bring relief to the country.

It administers large areas of publicly owned lands where protective measures of various types are needed; it annually entertains several millions of people recreation-bent and many long-desired improvements for their comfort needed to be installed; it possessed the administrative, scientific, and technical nucleus capable of quick expansion in handling relief measures; and it already had plans for long-time development needs on which to base sound improvement and constructive activities under the emergency measures.

With this background it was able to get the most from every dollar and every man available for national-park work under Public Works, Civil Works, and Emergency Conservation Work. All of these activities resulted in immeasurable good through conservation of priceless national and natural resources and in great economic good to neighboring vicinities, most of them off the beaten track of commercial development and presenting serious pictures of privation and actual want.

Through Public Works activities, still in progress, construction programs of great importance were made possible; through emergency conservation protection to the forests against fire, flood, and insect attacks was provided; and Civil Works filled in the gap between these two in a most valuable way. I cannot speak too strongly of the good work accomplished under all three agencies. Through them the National Park Service and the public visiting the park and monument areas have benefited immeasurably.

THE CIVIL WORKS PROGRAM

The Civil Works program for the National Park Service began on November 28, 1933, and was terminated April 28, 1934. At the peak of the program there was a total of 12,942 men and 192 women employed. The total expenditure amounted to $2,490,678, of which

$1,988,960 was for labor. The National Park Service program was divided into three main divisions, namely, Historical American Building Survey, National Capital Parks Project, and the National Parks and Monuments Project. The National Parks and Monuments Project included 72 national parks and monuments located in 27 States and the Territory of Hawaii.

The following outstanding projects were accomplished under Civil Works Administration grants:

HISTORICAL AMERICAN BUILDING SURVEY PROJECT

Employment of approximately 700 architects and draftsmen who collected data and made architectural drawings for historical purposes of some 860 buildings throughout the United States.

NATIONAL CAPITAL PARKS PROJECT

Employment of approximately 1,500 workers, who built swimming pools, landscaped park areas, improved roads and paths, planted trees and shrubs, and made other valuable improvements for the enjoyment of the people in the parks of the District of Columbia.

NATIONAL PARKS AND MONUMENTS PROJECT

Employment of some 11,000 workers for various types of work on the projects in the national parks and monuments, as follows:

Museum laboratory (western field headquarters).—Employment of artists, painters, sculptors, draftsmen, engineers, etc., in the preparation of numerous museum displays for the museums of the various national parks and monuments.

Archeological research and development of southwestern monuments.—Employment of some 600 workers, including Indians, cowboys, homesteaders, and trained archeologists, who accomplished excellent results in building roads and other badly needed improvements, as well as making valuable archeological studies in 15 national monuments in Arizona and New Mexico.

Glacier National Park.—Removal of 45 carloads of fire-killed timber, which was shipped to the Blackfeet Indian Reservation in Montana, to be used by the Indians for fuel and building purposes.

Historical parks and monuments in the East.—Valuable historical projects for collection of authentic historical data, and development of historical areas.

Other accomplishments.—Thousands of acres of fire-hazard reduction, many acres of erosion control, including construction of many check dams, reforestation and sodding, many miles of roadside beautification, construction of many foot and motor vehicle bridges, remodeling old buildings, preservation of historic and prehistoric areas and historically important structures, construction of roads,

trails, telephone lines, water and sewer systems, lighting facilities, camp-ground facilities, such as tables and fireplaces.

A large amount of important work that could not have been accomplished otherwise because of insufficient appropriations was accomplished in the various national parks and monuments through the medium of the Civil Works Administration, and the character of the work done by the Civil Works Administration employees in most cases was excellent. This, combined with the much needed relief which was provided to thousands of practically destitute people residing near the various parks and monuments, definitely establishes the Civil Works program as a successful enterprise in the national parks and monuments.

EMERGENCY CONSERVATION WORK

The National Park Service has benefited greatly from its opportunity to participate in the President's Emergency Conservation Work program. The establishment of Civilian Conservation Corps camps within the national parks and monuments has resulted in accomplishing work that had been greatly needed for years, but which was impossible and doubtless would have remained impossible of accomplishment under normal appropriations for many years. But the accomplishments must not be measured only in terms of the practical achievements of this nature, but also must take into account the remarkable rehabilitation of the young men, literally remaking them, changing their psychological aspect, and restoring them with healthy minds and bodies to normal industrial activities.

Following the resignation of former Director Horace M. Albright the present Director of the National Park Service has served as the Interior Department representative on the Advisory Council to Robert Fechner, Director of Emergency Conservation Work, and the Associate Director has served as alternate. Chief Forester J. D. Coffman has acted as liaison officer for the various bureaus of the Department of the Interior and has supervised the program for the national parks and monuments. Assistant Director Conrad L. Wirth, Chief of the Branch of Planning, has directed the Emergency Conservation Work in the State parks and related areas.

All work within areas under the jurisdiction of the National Park Service has been carefully planned by experienced landscape architects, engineers, foresters, and wildlife experts so as to preserve the distinct natural features, and in addition in the historical and military parks, historical technicians have been employed to insure the careful preservation and interpretation of the historical values.

A particularly happy feature of participation in the Civilian Conservation Corps activities by the National Park Service was the opportunity it afforded the Bureau to cooperate in an official way

with the State park agencies. It also made possible, on a slightly more limited scale, cooperation with a number of county and municipal park agencies which possess parks of a character similar to State parks.

The National Park Service is proud of the record that has been made in this new field. Its work has consisted of a careful study, in advance of each period of operation, of hundreds of applications, each setting forth a complete program of work for a 200-man camp, as well as the funds needed for its accomplishment; assistance, extended directly by its staff of technically trained inspectors, in study and criticism of detailed plans; and close contact with the work as it was carried out, to see that it was done efficiently, in accordance with the approved program, and in consonance with standards comparable with those established by the National Park Service for the national parks and monuments.

There can be no doubt that the Emergency Conservation Work program has been to a very large degree responsible both for increased interest in all types of parks in which it is being carried on and for the tremendous increase in State park acreage. Much of this increase in State park lands has come through donations by private individuals or corporations, although a number of States have continued or resumed park-land purchases. In some instances county or city funds have been expended in the purchase of desirable park lands. In many cases, the comprehensive planning required by the Park Service as a basis for Emergency Conservation Work, has indicated serious deficiencies in a number of parks which have been remedied in one way or another.

Since inauguration of the work, Virginia, West Virginia, South Carolina, Mississippi, Oklahoma, Nevada, and New Mexico have entered the State park field. New Hampshire, New York, Georgia, Florida, Alabama, Tennessee, Kentucky, Ohio, Illinois, Minnesota, Iowa, Missouri, Arkansas, Texas, North Dakota, Washington, California, and perhaps others have acquired new parks. The total acreage added to these systems since April 1, 1933, comes close to the half million mark.

During the first Emergency Conservation Work enrollment period, April 1, 1933, to September 30, 1933, 70 camps were established in national parks and monuments and 105 in State, county, and metropolitan parks. In the second enrollment period, October 1, 1933, to March 31, 1934, 61 camps existed in national parks and monuments and 239 in 32 States in State park areas; while in the third enrollment period, April 1, 1934, to September 30, 1934, 102 camps were allotted to national parks and monuments, and 268 camps were assigned to State parks and related areas with the camps existing in 40 different States. Plans have been made for 79 camps in national parks and

monuments and for 293 camps in State parks and associated areas with camps in 41 States for the fourth enrollment period which will extend from October 1, 1934, to March 31, 1935. In addition, the extension of the drought-relief program has caused the allotment of 6 drought-relief Emergency Conservation Work camps to national parks and monuments and 52 such camps to State parks and associated areas for the year ending June 30, 1935. The Emergency Conservation Work program was extended to the Territory of Hawaii with 577 enrollees allotted to the Territorial portion and one 200-man camp to Hawaii National Park. Two regular fourth-period camps and one drought-relief camp, assigned to the Reclamation Service, will also be managed by this Service. There will be in the fourth period a total of 431 camps under the direct supervision of this office. Approximately 100,000 young men in all have been engaged in the work subject to the direction of the National Park Service with the employment of about 4,000 professionally and technically trained individuals to direct the work.

A statement of material accomplishments under the Emergency Conservation Work program in National, State, and allied areas under National Park Service supervision is given in table 9 on page 372.

PROGRESS UNDER REORGANIZATION

The last annual report made reference to plans then going forward under the President's Executive order of June 10, 1933, for the reorganization of all Federal park activities under the National Park Service.

During the current year substantial progress has been made in further realizing and organizing the new park system thus begun. Two units, having their principal activities in the District of Columbia, namely the branch of Public Buildings and the National Capital Parks, have been coordinated with the entire system to a degree that would have seemed impossible 12 months ago.

The new Superintendent of National Capital Parks was for some years at the head of Mesa Verde National Park, the most widely known of the areas in the Southwest set aside to preserve prehistoric American Indian life. He has brought to his new task a long experience with the problems of general park administration and a sympathy for the preservation of primitive and historical conditions and with their proper interpretation in the educational program. Landscape treatment, such as is in vogue in the entire National Park Service, as well as some nature guide and historical educational service have been introduced during the year in the National Capital Parks with most gratifying results and response from the public.

In the same way, the National Park Service has tended to stamp its essential character upon the newly acquired historical areas, many of which lie east of the Mississippi River.

The rise of historical parks and monuments in the last 12 months is perhaps the most significant single feature of National Park Service development. Four years ago this program did not exist, except for some incidental treatment of historical matters in certain of the western parks and monuments and in Acadia National Park in Maine. A year later Colonial and George Washington's Birthplace National Monuments in Virginia had entered the National Park Service family, destined to be the pioneer members of the now far-flung historical system. Another year passed and the Morristown National Historial Park idea had been born, to be realized on July 4, 1933, with the transfer of deeds from the donors of the land to the United States. Meanwhile Shenandoah National Park and Great Smoky Mountains National Park were authorized, each having large historical applications.

Then with Federal reorganization came the transfer of numerous historical areas, including Lincoln Birthplace in Kentucky; Fort McHenry in Baltimore Harbor, of Star-Spangled Banner fame; old Spanish Forts Marion and Matanzas at Saint Augustine, Fla., and Fort Pulaski at Savannah, Ga., as well as many nationally famous battlefield sites like Guilford Courthouse, Cowpens and King's Mountain in the Revolutionary period; and Antietam, Gettysburg, Shiloh, Vicksburg, Chickamauga, Kenesaw Mountain, Fredericksburg, Chancellorsville, Wilderness, Spotsylvania, Petersburg, and Appomattox of the Civil War era.

This list is only suggestive. The Statue of Liberty and the Wright Memorial, where the first successful flight by a heavier-than-air machine occurred, serve to illustrate, in contrast to the battlefield sites, the wide variety of historical areas and problems now being handled by the National Park Service.

Especially is this apparent if one remembers that to the dozen or so southwestern prehistoric parks and monuments have now been added half a dozen more heretofore controlled by the United States Forest Service and two midwestern mound areas at Shiloh National Military Park and at Mound City near Chillicothe, Ohio, formerly under the jurisdiction of the War Department. During the last session of Congress authority was given for adding to the national park and monument system the now famous Ocmulgee Fields near Macon, Ga., where some astonishing archeological evidence has recently been unearthed through scientists working under the auspices of the Smithsonian Institution and the National Park Service, which tends to prove the presence of a much earlier prehistoric life in the

Southeast than has heretofore been supposed, as well as its possible close connection to the southwestern cultures.

The ideal Federal program of historic sites preservation thus appears to be in a fair way of realization in this new unity of jurisdiction under the National Park Service. Already a basic philosophy has been evolved by which the different areas in the system are related to each other in definite fashion. Thus from the earliest prehistoric events of American life down to the time when the white man, after over three centuries spent in conquering American soil, conquered also the air, historic sites connected with various steps of this amazing drama of civilization will be preserved and used for the purpose of interpreting this engrossing story to those who visit these areas.

In the same way that the grand scenic areas of the West have been established as national parks and have gained a permanent place of undying affection in the hearts and minds of the American public, now the archeological and historical parks are rising to their rightful place in the genuine appreciation of the people. Not only do these areas typify the progressive story of American history, but also they represent much of the idealism and sacred tradition so dear to this Nation. For that reason their educational and intrinsic value in the Federal program of national parks and monuments is great.

NATIONAL PARK SERVICE PREPARING RECREATIONAL LAND-USE REPORT

By Executive order of June 30, 1934, the National Resources Board was established by the President "to prepare * * * a program and plan of procedure dealing with the physical, social, governmental, and economic aspects of public policy for the development and use of land, water, and other national resources * * *. The Board shall submit a report on land and water use on or before December 1, 1934, * * *."

To the National Park Service has been assigned the subject National and State Parks and Related Recreational Activities. To prepare this section of the National Resources Board report, the Recreation Division of the Board was set up in the Park Service with George M. Wright, Chief of the Wildlife Division, as its director, and Herbert Evison, Supervisor of State Park Emergency Conservation Work, as assistant director.

The main portion of the Recreation Division report is to be in the hands of the Board by October 1, but the preparation of supplemental material will probably continue a month or two longer.

Comprehensive information is being assembled regarding recreational facilities and recreational needs throughout the country, which should be invaluable in determining a broad recreational program for the United States.

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SUBMARGINAL LAND ACQUISITION FOR RECREATIONAL USE

As a preliminary step to proper land utilization in the United States, $25,000,000 was provided by the Federal Surplus Relief Corporation for acquiring lands of low production or lands not now in their proper use, described as submarginal lands, in an effort to reallocate these lands to proper usage. Of this amount, $5,000,000 will be used for acquiring certain lands for recreational use, and the National Park Service was designated to develop this phase of the program. A general plan for carrying out this plan has been evolved and the work is proceeding satisfactorily. Three types of areas are being studied. The first and largest of these comprises a few well located regional recreational areas, consisting of from 10,000 to 15,000 acres that may be used by large numbers of visitors. The second type consists of smaller tracts of 1,500 to 2,000 acres in close proximity to the larger industrial centers for use by people of the lower income group and under-privileged children, for family camps, children-group camps, and organization camps. The third type is composed of tracts of 20 to 50 acres along well traveled highways that may be used as picnic areas by the traveler or family groups seeking a day's outing. These areas have been termed "waysides." Since the need of the last two types of areas is deemed most urgent, they are being given first consideration.

This program requires close cooperation with the Department of Agriculture and the Federal Emergency Relief Administration to determine what lands are submarginal and to solve the rehabilitation problems of persons occupying lands that are selected for purchase.

The selection of the areas, the obtaining of options and other pertinent data, the development of plans, the execution of such work as can be done by the Civilian Conservation Corps and the Federal Emergency Relief Corporation, and the making of agreements with the States and their political subdivisions regarding development, management, and maintenance of the areas are the direct responsibility of the National Park Service.

The recreational program will be an important factor in the social welfare of the country and will require cooperation with the States and their political subdivisions for some years to come. It is important that legislation be enacted that will make it possible to carry on the work beyond the 2-year emergency period.

LEGISLATION URGED PROVIDING FEDERAL COOPERATION IN STATE PARK DEVELOPMENT

Recent activities of the Administration, particularly in emergency conservation work and new land utilization, have conclusively demonstrated the need of some form of cooperating agency between

State recreational units and the Federal Government. Since recreation is an important function of the National Park Service, as outlined in the enabling act of Congress, if such cooperation be extended it is desirable and logical that it be undertaken through the National Park Service.

The submarginal lands now being retired for recreational purposes in all probability eventually will come under some sort of State jurisdiction. This probability, coupled with the close relationship now existing between the National Park Service and the various States through emergency conservation activities, motivated the drafting of what is known as the State park bill (S. 3742 and H.R. 9788 of the 72d Cong.).

This legislation proposes to give the Secretary of the Interior power to authorize the National Park Service, cooperating with the Federal agencies, to make a comprehensive study of the public parks, parkways, and recreational area programs of the United States. The Park Service would be authorized to aid the several States in planning, establishing, improving, and maintaining these areas. The bill would also authorize the Secretary, subject to the approval of the President of the United States, to transfer to any State, by lease or otherwise, such public lands as he deemed advisable under the provisions of the bill. Should the lands be diverted to improper use they would, under the bill, revert to the United States.

This bill received the cordial and sympathetic support of the Secretary of the Interior. With a few minor amendments it was favorably acted upon by the Senate Committee on Public Lands and Surveys and by the Committee on Public Lands in the House of Representatives. Introduced late in the session, it failed of passage in the House during the last minute rush before adjournment of the Seventy-third Congress. It is hoped that some legislation along lines laid down in this bill may receive early attention by the new Congress.

STATUS OF PARK AND MONUMENT LANDS

Since the acquisitions of new areas reported in the annual report for 1933, and covering land changes to September 30, 1933, no new areas have been added to the system. However, jurisdiction over the 16 national monuments transferred by the President's Executive order of June 10, 1933, from the Department of Agriculture to this Service was not assumed until November 1933. With these areas the national monuments number 67.

LANDS ADDED TO EXISTING MEMBERS OF SYSTEM

Lands were added as follows to several members of the national parks system to include areas of scenic, historic, or scientific importance:

Acadia National Park.—The total area of this park was increased to 13,832.24 acres by the donation of 1,520.13 acres to the Government.

Great Smoky Mountains National Park.—An area of 97,725.72 acres was added by conveyances from the States of North Carolina and Tennessee, bringing the total area of the park up to 394,088.35 acres. The total acreage necessary for complete development of the park has been set by Congress at 400,000. The North Carolina section of the park was brought to completion on May 1, when title to two large tracts owned by the Ravensford and Suncrest Lumber Cos. passed to the United States.

Condemnation proceedings already have been instituted to acquire the last large tract of land involved—the Morton Butler property, comprising 25,000 acres. In addition there remain 76 small holdings, 5,364.74 acres in all, to be brought into the Tennessee part of the park.

Fredericksburg and Spotsylvania County Battlefields Memorial.—Within these areas a total of 53.37 acres were acquired. The total acreage within the Fredericksburg, Spotsylvania Courthouse, Chancellorsville, Salem Church, and Wilderness areas is 2,413.37 acres.

Petersburg National Military Park.—Eleven acres were acquired, bringing the area to a total of 509.99 acres.

Stones River National Military Park.—The area of this reservation was increased to a total of 410.60 acres by new acquisitions.

Vicksburg National Military Park.—An area of 0.46 acre was added to provide a site on which to place a bust of Brig. Gen. A. J. Smith. This brings the total area to 1,322.46 acres.

Pinnacles National Monument.—By proclamation dated July 11, 1933, 5,001.78 acres were added to the Pinnacles Monument, bringing the area to 9,908.39 acres.

PENDING BOUNDARY PROBLEMS

No important pending boundary problem was adjusted during the year. The situation concerning boundary adjustments long recognized as vitally important to the administration of the parks and the welfare of the native wildlife is as follows:

Yellowstone National Park.—No congressional action yet has been taken upon the report of the Yellowstone Park Boundary Commission filed in 1930. This Commission, headed by Dr. A. E. Morgan, now chairman of the Tennessee Valley Authority, recommended the immediate addition of the Bridger and Two Ocean Pass region to Yellow-

stone Park and pronounced that portion of the Thorofare-Upper Yellowstone watershed adjacent to the east boundary of Yellowstone Park to be of national park quality.

Rocky Mountain National Park.—Addition of the mountain and glacier country to the south, included in the original park plan, and of a small acreage to permit a proposed parkway planned to bring the new Trail Ridge Road to a suitable terminus at park headquarters near Estes Park should be made possible through legislation.

The Grand Lake addition, previously authorized by Congress, can be established by Executive proclamation as soon as plans are completed for the improvement of Grand Lake Village to resemble a typical frontier village.

Yosemite National Park.—One project of interest in the national park completion program is the restoration of the Minaret region to the park. The nearby Devils Postpile area now a national monument was transferred to the jurisdiction of the National Park Service from the Forest Service under the Executive order of June 10, 1933. The larger area, however, should be restored to Yosemite National Park in the interests of good administration.

Sequoia National Park.—No developments occurred during the year in connection with the plan to add to this park the Mineral King region at the head of the watershed of the East Fork of the Kaweah River. The remainder of the watershed is within the park.

General Grant National Park.—Minor adjustments on the east and south lines of General Grant Park are required for administrative and protective purposes. The problem is one merely of adjustment of boundaries rather than a material increase in acreage.

Kings River project.—Another area near Sequoia and General Grant National Parks, the Kings River area, has long been considered, both as an extension to Sequoia Park and as a separate park area. This project was recommended many years ago by the great naturalist John Muir. Both Directors Mather and Albright made constant efforts throughout the course of their administrations to bring Kings River under park administration, but local irrigation and power interests continue to oppose the plan. The State road now nearing completion into the canyon inevitably will bring about a recreational use of the area, and it is urged that if such use is to be permitted it should be under the supervision of the National Park Service in connection with the administration of the nearby Sequoia and General Grant National Parks.

Grand Teton National Park.—Success for this project seemed near toward the close of the last session of Congress when a bill to enlarge the park passed the Senate. It failed, however, to come up for a vote in the House. It is expected that a similar bill will be introduced during the next session.

The proposed bill provided for the addition of more than 30,000 acres of private lands acquired by John D. Rockefeller, Jr., for the purpose, over 40,000 acres of the unappropriated public domain, and a tract of national-forest lands including the northern third of the Teton Range, Jackson Lake, and the road to Yellowstone Park to the north.

This bill differed from previously proposed legislation in that it provided for the administration of a special wildlife area by the Biological Survey and for Government compensation to those counties in which private lands would be withdrawn from taxation. These provisions provided a solution for the problems interfering with the park extension in the past.

Grand Canyon National Park.—The necessity of making Grand Canyon Park a complete biological unit as well as a scenic reservation has been emphasized for many years by scientists, including John C. Merriam, president of Carnegie Institution of Washington. To this end it has been urged that the park be enlarged both to the north end and to the south of the Great Gorge to include a complete range of life zones and biological conditions. The economic development of natural resources within this proposed extension unfortunately places the probability of its addition to the park far into the future.

Crater Lake National Park.—The Diamond Lake area to the north, proposed for park extension, now is administered by the Forest Service. It is still considered essential for the future development of Crater Lake National Park.

Carlsbad Caverns National Park.—The Guadalupe Mountains region, once considered for establishment as a separate park unit, is now being studied as a possible addition to Carlsbad Caverns. It would add a very fine surface scenic area and excellent wildlife attractions to the existing park. As the proposed extension involves a portion of the Lincoln National Forest, the matter will be submitted to the Secretary of Agriculture for consideration.

Hot Springs National Park.—It has been suggested that additional recreational facilities be added to the existing medicinal facilities of Hot Springs Park by including Sugarloaf Mountain, North Mountain, West Mountain, and the eastern shore of Lake Hamilton within the boundaries. This matter is to be studied.

Platt National Park.—Reports as to the outstanding geological phenomena of portions of the Arbuckle Mountains have led to the suggestion that certain areas therein be added to Platt National Park, to be connected by a parkway. These tracts are Indian allotments from which it is reported the Indians have been unable to derive any income. An investigation is yet to be made to determine the advisability of this extension.

Wind Cave National Park.—A proposed extension to this park would include the canyon to the north to provide for an approach road. Negotiations for transfer of the game preserve managed by the Bureau of Biological Survey of the Department of Agriculture are under way.

National monuments.—Several proposals have been made for the extension of boundaries of various national monuments. They cannot be considered in detail here. However, two important extensions are being considered for Glacier Bay National Monument in Alaska, and Mount Olympus National Monument in Washington. The proposed Glacier Bay extension embodies a change of boundary lines from the mountain divides outward to the west and south to shores of the surrounding bays and inlets. The purpose of this proposed extension is to provide a complete biotic unit for the Alaska Brown bear, to provide accessible recreational features, and to facilitate boundary patrol.

There has been agitation for many years concerning the enlargement of the Mount Olympus National Monument on the Olympic Peninsula in Washington. After its original establishment as a national monument under the Forest Service, the area was reduced several different times by presidential proclamation. Now a movement is on foot to restore the original boundaries, and even increase them to include important recreation area with the end in view of changing its status to that of a national park. Any extension of boundaries will provide additional winter range for the large herd of Olympic Elk for the safety of which the monument was originally established.

Minor changes in monument boundaries which are under active consideration at present are those of Muir Woods, Chiricahua, Dinosaur, and White Sands National Monuments. The Muir Woods extension is nearly completed, the only remaining step being the actual signing of the proclamation by the President. The additional area will provide a suitable site for an administration building. The proposed additions to Chiricahua and White Sands are still under consideration.

PROGRESS TOWARD CONSUMMATION OF NATIONAL PARK AND MONUMENT PROJECTS AUTHORIZED BY CONGRESS

Satisfactory progress toward consummation of parkhood for several national park projects authorized by Congress may be reported.

Shenandoah.—The Virginia State Commission on Conservation and Development is entering the final stages preparatory to presenting to the United States deeds to the Shenandoah National Park. Minor matters such as clearance of titles and removal of squatters remain to be accomplished.

Mammoth Cave.—Assurances have been given that the lands necessary to establish the Mammoth Cave National Park soon will be acquired by the Federal Government. This will be possible under the provisions of the act of Congress approved May 14, which defined a minimum area of 20,000 acres for administration and protection by the National Park Service. No general development for public use may be undertaken, however, until the major portion of the remaining lands specified for park inclusion, including the caves thereof, have been accepted by the Secretary of the Interior.

Isle Royale.—The status of the Isle Royale project remained practically unchanged during the year.

Everglades.—The proposal to establish the Everglades National Park in southern Florida received official sanction when approved by President Roosevelt on Memorial Day.

This project, when completed, will add to the system its only tropical national park. Long stretches of beaches, particularly in the Cape Sable region, mangrove forests, vast stretches of the plains-like Everglades with intricate waterways, and unique flora and fauna will provide unlimited sources for study and recreation.

Delineation of boundaries of the proposed park by the Secretary of the Interior, within a maximum taking area of 2,000 square miles, is provided by the act authorizing the Everglades Park establishment. Studies will be made by the National Park Service this coming fall and winter to determine the actual boundary lines desired. It is understood that after approval of the proposed boundary, a commission will be appointed by the Governor of Florida to acquire the necessary lands.

The act further provides that all privately owned lands within the area shall be donated to the United States before it can assume park status, and in addition that the Federal Government, for the period of 5 years from the date of the act, shall not expend any public moneys for the protection, administration, or development of the park.

Bad Lands National Monument.—Establishment of this monument under the terms of the authorization of Congress approved March 4, 1929, is contingent upon the acquisition by the State of South Dakota of private lands within the proposed boundary, and their transfer to the Federal Government without cost; also upon the construction by the State of an approach highway.

Steps now are being taken by the State toward the completion of the highway, but there appears no probability that the necessary lands for the national monument will be acquired in the near future.

Monocacy National Military Park.—On June 21, 1934, President Roosevelt approved the act authorizing the establishment of the

Monocacy National Military Park, in Maryland, upon the donation of the necessary lands to the Federal Government.

Ocmulgee National Monument.—By act of Congress approved June 14, 1934, the establishment of the Ocmulgee Monument in Georgia was authorized to preserve Indian mounds of great historical importance. Actual establishment of the monument is contingent upon the donation of the lands involved to the United States.

Pioneer National Monument.—As its name indicates, this monument, when established, will be of historical interest. Approved by act of Congress June 18, 1934, when established it will include four areas connected with Daniel Boone, famous Kentucky pioneer. It is planned to connect these four points with a memorial highway. The lands for this monument also must be donated to the Federal Government.

INVESTIGATION OF PROPOSED PARKS AND MONUMENTS

A total of 91 recommendations for the establishment of national parks and 106 for national monument establishment have been presented to the Service in the past. Of 31 national park proposals investigated during the past year, 8 were reported favorably and 23 adversely. Of 38 national monument proposals investigated during that period, 9 were reported favorably and the remaining 29 were reported adversely. There still remain 54 proposed national park areas and 72 proposed national monument areas to be investigated. Several of these will be investigated during the coming year.

The problem of investigating all of the areas proposed for parks and monuments is a difficult one. Due to an insufficient personnel it has been necessary to postpone examination of less important ones in favor of those demanding immediate action. Practically all of this work has been done in the past by Roger W. Toll, Superintendent of Yellowstone National Park. It is necessary for him to do the investigation work during the winter season when his presence in Yellowstone is not imperative.

PROGRESS IN RESEARCH AND EDUCATION

The naturalist and historical educational programs have advanced to new levels of development despite stringent curtailment of the regular park budget. Various forms of emergency relief, such as Public Works and Emergency Conservation Work, continued to provide a temporary means of dealing with the heavy demands on both the administrative and educational machinery of the Service occasioned by the addition of many new areas through the reorganization of the Federal parks system. But for the aid of these emergency activities and that of the Civil Works Administration for a brief period during the winter and early spring, the educational

program could not have operated successfully, especially in the archeological and historical areas where, thus far, very little permanent machinery exists. In these eastern historical areas, where educational activities are being tested out for the first time, thousands of visitors already have tried out the new order of things and have seen for themselves what it means educationally to visit the places where great national events occurred, while at the same time obtaining from a highly trained personnel a clear story of the historical situation.

Notable progress has been made in furnishing variety in types of guided trips to meet public interest and in providing additional auto caravans to notable features. A greater diversity of lecture subjects has been attempted and museum exhibition initiated in many places and improved in others. There is a distinct trend toward utilizing more mature men on the educational staff than heretofore and toward better methods of helping the visitor to understand and appreciate main features.

The impetus given nature studies by the National Park Service, which this year introduced nature walks into the National Capital parks, now has been carried over into State parks and even into municipal parks. The National Recreation Association is contemplating similar programs in connection with playgrounds.

The usefulness of such observation stations as the Yavapai Station on the south rim of the Grand Canyon and the Sinnott Memorial at Crater Lake, which were especially designed to help people understand scientific features, is more apparent each year. There is a growing demand now for similar stations at Bryce Canyon and on the north rim of Grand Canyon.

The Yosemite program was the first to furnish specialized field trips in geology, trees, flowers, and birds, in addition to the regular nature walks. Innovations in the form of an exploration hike, a half-day spent exploring away from the trails, with the destination a surprise, and a moonlight hike to view the sunrise attracted such crowds that handling was difficult. Two auto caravans devoted to Indian legends and to history have proved their worth. The so-called "matinee" or question hour in one of the camp grounds continued popular.

The intimate personal service to the visitor afforded by custodians of national monuments continues to constitute an educational program of which the Service is very proud. Small groups led about prehistoric ruins secure dependable and useful information in interpreting what they see.

MUSEUM DEVELOPMENTS AND EXHIBITS

New museum exhibits have been provided at Bryce Canyon National Park. At Yosemite backgrounds have been painted for life zone groups and many exhibits rearranged. At Sequoia the museum is being renovated and new exhibits installed. The museum at Rainier has also been renovated and many new exhibits provided. These improvements and many others have had expert supervision by museum experts of educational field headquarters at Berkeley. Attention is now being given the planning and construction of exhibits for new museums at Aztec and Scotts Bluff National Monuments and the historical museum planned for Rocky Mountain National Park.

Funds were provided under the Public Works program for the construction of a park museum at Morristown National Historical Park; for an addition to the present museum at Mesa Verde National Park; and for the reconstruction of the Reynolds House Museum, Moore House, and Swan Tavern (administration building) at Colonial National Monument. Public Works funds also were provided for administration buildings in which museum space is provided for Aztec Ruins and Scotts Bluff National Monuments and Chickamauga-Chattanooga, Vicksburg, Guilford Courthouse, and Shiloh National Military Parks.

Under emergency allotment the field division of education was enabled to inaugurate a program of construction of museum exhibits. During this program 129 projects were completed, including relief maps, relief models, habitat groups, miniature models of extinct prehistoric animals, cremation burials, metal labels for botanical gardens, models of architectural details, and drawings. This program also provided numerous photographs and lantern slides for use in park educational programs.

In the East similar activities were initiated. Models of the Yorktown battlefield were made in a workshop established at the Colonial National Monument and later a centralized model laboratory for the East established at Fort Hunt, Va. Nontechnical assistance in this work was furnished through the Civilian Conservation Corps camps.

NATIONAL PARK EXHIBITS AT A CENTURY OF PROGRESS

In addition to last year's exhibits at A Century of Progress Exposition in the Hall of Science and the Federal Building, which were renovated and again placed on display, there was installed in the medical section of the Hall of Science a general educational exhibit sponsored by the Hot Springs Chamber of Commerce, showing what the Government is doing in Hot Springs National Park.

PROGRESS IN HISTORICAL FIELD

The historical work has grown far beyond normal expectations. The establishment of the Colonial National Monument in 1930–31, followed by the Washington Birthplace National Monument and the Morristown National Historical Park, gave new impetus to the historical work begun back in 1906 when the Antiquities Act was passed by Congress giving authority for the reservation, by presidential proclamation, of areas of historic, prehistoric, or scientific interest, to be protected in national monuments. That year the El Morro National Monument became the first historic area to be included within the national park and monument system. The prehistoric already was represented by Casa Grande, and in 1906 Mesa Verde National Park and Montezuma Castle joined the prehistoric group.

The addition of the Colonial, Washington's Birthplace, and Morristown areas was but a normal growth in the historical field. But the Service was not long left to work with this normal problem. When the Executive order of June 30, 1933, added to that field national military parks and monuments, national cemeteries, and battlefield sites, the National Park Service was faced with the necessity of laying plans to build its program of interpreting these areas to the public as it had been doing for the other parks in the system.

Naturally, the bringing of so many areas of historical importance into the system placed new demands upon the historical service. The additional problems occasioned by the transfer of the military parks, monuments, and battlefield sites from the War Department created a need for additional personnel with training in history. In meeting this need, as mentioned elsewhere, the various emergency programs were of inestimable value.

LIBRARY DEVELOPMENTS

Plans have been studied for the development of adequate library facilities for national parks and national monuments. In many of the new administration buildings authorized under the Public Works program space is provided for library purposes.

Some progress was made in library work under the Civil Works program at educational field headquarters at Berkeley, Calif. During this period four workers were engaged in research and clerical work in connection with preparing an annotated bibliography. The research workers cooperated with the library workers by supplying annotated bibliographies compiled when manuscripts were written. These restricted bibliographies have become a part of the general bibliography.

In all of the library work the University of California and the School of Librarianship extended generous aid and unusual privi-

leges, permitting the use of laboratory room and desk equipment. Calls were made upon the librarians of four institutions in northern California for the purpose of soliciting duplicate materials to be presented to the National Park Service.

The small fund appropriated each year is inadequate to care for library needs and there is grave need for trained personnel to develop and carry out a well-organized library program throughout the park system. The able work of a special committee of the American Library Association, headed by C. E. Graves, has stimulated interest and provided a plan of development.

THE EDUCATIONAL ADVISORY BOARD

The Educational Advisory Board at its annual meeting on February 26–27, 1934, discussed the National Park Service policy of complete protection for all fauna in the national parks. In view of the fundamental duty of preserving the wildlife of the national parks in its present status and the ever-present danger of dissemination by disease, the Board requested the Wildlife Division to prepare a plan for the development of specific research activities on large game animals and other forms of animal life in Yellowstone National Park. A museum development plan for the park system was discussed and approved.

In connection with the proposed reclassification of areas now administered by this service, the Board recommended that the classification "national parks" be retained to embrace the great scenic national parks all of which now bear this name by act of Congress; provided, however, that in the judgment of the Board, Hot Springs, Platt, Wind Cave, Abraham Lincoln's Birthplace, and Fort McHenry National Parks should be placed in more appropriate park categories in view of the fact that their characteristics are so essentially different. The Board was in agreement that it would be desirable to retain in the category of national battlefield parks those areas notable only for the one feature of having been a battlefield.

The national park library program was discussed and it was the opinion of the Board that adequate working libraries should be encouraged in the several parks as needed, rather than combined in a centralized library, and that centralized administration be maintained for the purchase of books, union cataloging, and interchange of books to various park libraries.

YOSEMITE SCHOOL OF FIELD NATURAL HISTORY

The Yosemite School of Field Natural History, a training school for naturalists desirous of entering national park work, held its tenth session. A fine group, consisting of 12 men and 8 women,

was enrolled. For the first time applications from men far outnumbered those from women. The course this year included a week devoted to intensive ecological study and a 2 weeks' pack trip to the remote northern sections of the park. The class, almost entirely graduate students, was divided into committees to work under two noted instructors of the University of California and a member of the National Park Service Wildlife Division. An increasing number of graduates of this school are finding employment as naturalists. Five of last year's class obtained ranger naturalist positions in the parks this year.

EMERGENCY CONSERVATION WORK EDUCATIONAL PROGRAM

Soon after the beginning of Civilian Conservation Corps work in national parks, programs of lectures and field trips were placed in effect where naturalist service was available. Assistant Director Harold C. Bryant, as a member of the advisory committee, helped to plan the more permanent program under the direction of the Office of Education, which provided for educational advisers and leaders. In order to provide visual instruction, projectors were provided and many educational films purchased and produced, most of which were sound films. In addition each park camp was furnished with a filmstrip projector and strip films were furnished regularly. Production of motion-picture films by the Park Service has made possible a regular distribution to camps located in national parks and monuments.

COURSES OF INSTRUCTION IN NATIONAL PARKS CONDUCTED BY OUTSIDE INSTITUTIONS

Various universities and colleges continued to send field classes to the different park and monument areas. The Omnibus College, consisting of approximately 500 people, mostly school teachers representing every section of the United States, visited several military and historical parks east of the Mississippi River, indicating increasing interest in these projects in addition to the usual western tour. Oglethorpe University and Southwestern Teachers College groups again toured the national parks.

Professor Meal, of Southern Oregon State Normal School, took a group of geology students to the Lassen Volcanic National Park. Although the weather prior to their work in the park interfered with schedules to such an extent that the group was forced to abandon some of its projected plans and shorten observations in all cases, the school hopes to make this a part of the required field work in general geology in the future.

The Winold Reiss Art School, under the auspices of the College of Fine Arts of New York University, began its summer session in Glacier National Park on June 15, to continue for 3 months. The

school is located at the picturesque chalets on St. Mary Lake, one of the most noted of the 250 lakes in the park. Courses include drawing, painting, sculpture, and mural work.

Arrangements were made for holding the fourth University of Hawaii summer session in Hawaii National Park from June 18 to July 27. Seven courses are offered, each giving residence credit toward a degree on the same basis as courses given on the campus in Honolulu.

SCIENTIFIC RESEARCH

A number of interesting scientific studies were made in the national parks and national monuments during the past year. A report was submitted by the Wildlife Division recommending procedure to coordinate the research reserves plan with basic park policies and the administrative code.

In Yellowstone National Park geological research was carried on by graduate students from Columbia, Chicago, Princeton, New York University, Western Reserve, and Vanderbilt. Eleven students spent most of the summer on work in the park or problems connected with the geology of the park region and at least 15 others entered the park at different times from the Red Lodge School for short periods. Prof. William Taylor Thom, Jr., of the geology faculty of Princeton University, was director of the International School of Geology at Red Lodge, Mont., and was largely responsible for the geological program attempted. Other problems, which when solved will lead to important results in connection with Yellowstone geology, have been worked on by C. J. Hares and Prof. Walter Bucher.

Various governmental, semipublic, and private agencies have continued to aid materially. Dr. A. P. Meinecke, of the Bureau of Plant Industry; Dr. O. J. Murie, of the Bureau of Biological Survey; Dr. T. S. Palmer, formerly of that Bureau; Harry Hommon, of the United States Public Health Service; Dr. A. S. Hazard, of the Bureau of Fisheries; Dr. J. C. Merriam, of the Carnegie Institution; Dr. Alexander Wetmore, of the Smithsonian Institution; and Dr. Waldo G. Leland, of the Council of Learned Societies, have each of them personally and through the organizations they represent assisted the work of the national park program. Dr. Charles Moore, of the Fine Arts Commission, has given generously of his time to the careful investigation of many problems relating to the work, as has Mr. H. P. Caemmerer, the secretary of the Commission.

Investigations range in subject matter all the way from fine arts and history in the District of Columbia and vicinity to geology, plant and fish life, and archeological excavations in the Southwest and far West. In the latter connection, the work of Jesse L. Nusbaum, of the Laboratory of Anthropology at Santa Fe; Earl Morris, of the Carnegie Institution; Dr. Harold S. Colton, of the Museum of Northern Ari-

zona; and Neil Judd and F. H. Roberts, of the Smithsonian Institution, has been outstanding in giving help on numerous matters which have been referred to them.

Dr. John C. Merriam, president of the Carnegie Institution of Washington, has continued studies of the scientific features of various parks and methods of presenting the findings of scientists to the general public. A preliminary report has been prepared by a committee of three men headed by R. W. Leighton, chairman of research in the University of Oregon, who have been studying ways of presenting the beauty of Crater Lake in such a way as to have the public appreciate it. Dr. H. C. Bumpus continued studies of educational methods in Yellowstone National Park. Dr. H. E. Gregory continued geological studies in Zion National Park for the United States Geological Survey. Dr. N. E. A. Hinds, of the University of California, continued geological studies in Grand Canyon. The Museum of Northern Arizona has continued archeological research in the ruins of Wupatki National Monument. Many other eminent scientists visited the national parks pursuing independent investigations.

SCIENTIFIC DISCOVERIES

Several discoveries of interest to science were made in the national parks during the past year. In Crater Lake National Park there was discovered a carbonized stump covered by volcanic ash on the rim of the lake. In Yosemite National Park, lying against an ice pillar on Mount Lyell Glacier, was found a mountain sheep ram in a fine state of preservation. This was a rare find and created much comment throughout the country. Wider distribution of the Mount Lyell salamander is indicated through the finding of this rare amphibian on Half Dome.

New in the history of the Mesa Verde is the discovery of a grave containing the skeletons of two Indians of prehistoric times. The significance of this find is that to find two bodies rather than one or several is unusual. Important mammal bones were recently taken from a deep creek in Kaibab limestone in Wupatki National Monument. Archeological research in western historical areas has led to some extremely interesting scientific information concerning early American glass, china, and pottery ware, as well as many other articles of domestic use. Perhaps the outstanding finds of the year in this field are in the Ocmulgee Fields at Macon, Ga., a national monument project, where an ancient cornfield and kiva-like structure dating back approximately 1,000 years, have been found.

ANIMAL CONDITIONS

The year witnessed important progress in the wildlife program. Wildlife administration has been brought under the advisory supervision of the Wildlife Division and is carried out under the policy which was adopted by the Service this year as a basic guide.

Among many projects which moved forward this year are the following:

A program for the construction of bear-proof safes and bear-proof garbage cans has been inaugurated under Emergency Conservation Work funds as an experiment at West Thumb camp ground, to make food unavailable to bears within this camp ground and to provide adequate facilities for the food supplies of campers in such manner that they will not be forced to leave food in their tents or automobiles, which practice has occasioned loss of personal property to campers.

Of the surplus buffalo rounded up in Yellowstone National Park, 12 live shipments were made and 165 were slaughtered and sent to nearby Indians. An attempt is to be made to establish a portion of the buffalo herd in Hayden Valley where it will be more apt to be seen by visitors.

A study is being made of the Roosevelt elk in the Mount Olympus National Monument. Reports thus far received indicate that the Roosevelt elk is not in danger of extermination. The northern Yellowstone elk herd is far too large for the winter range and a study is being made with a view to alleviating this condition. The tule elk, which have been in Yosemite National Park as exotics, have been successfully transplanted to Owens Valley on the east side of the Sierra.

Trumpeter swan censuses have been made throughout the year. Twenty mounted and framed enlargements of the trumpeter swan were sent out to the various duck clubs and agencies concerned throughout the Yellowstone and Red Rock Lakes region, advertising the present status of the trumpeter swan and advocating caution during the hunting season. This action resulted in Montana's posting a $50 reward for the arrest and conviction of anyone convicted of shooting a trumpeter swan. Visitors are discouraged from going to any of the lakes where swans are known to breed. It is hoped that these measures will help protect this rare species.

White pelican fledglings of the year were banded at the pelican rookery in Yellowstone Lake, which should lead toward more definite knowledge of the migration route of these parasite-infested pelicans and to a better understanding of the possible influence they may have on distribution of this parasite.

Fifteen deer were shipped from the Mount Vernon estate to the proposed Shenandoah National Park area. They were released in

Big Run Valley on the west side of the mountains approximately midway between the Spotswood Trail and the south end of the proposed park. This is one of the wildest and most isolated sections of the park and an ideal location for deer, with plenty of food and cover. There are no inhabitants along the ridge within 8 or 10 miles of Big Run.

Favorable reports have been received regarding moose except in the proposed Isle Royale National Park, where, it is reported, there is insufficient forage.

Better conditions prevail among the Kaibab deer. Favorable conditions are reported for antelope and they are seen in increasing numbers in Petrified Forest and the south rim of Grand Canyon. Improvement is shown in the condition of mountain sheep in Mount McKinley.

An Emergency Conservation Work wildlife program has been inaugurated and set up in various of the national parks. Naturalist technicians and naturalist assistants are being assigned the duties of safeguarding food and cover of animal life by directing Civilian Conservation Corps activities to the end that breeding grounds and food of wild birds and animals are not destroyed, by securing fundamental data on the kinds, life histories, and habits of animal life, and by offering recommendations as to proper management and restoration programs.

FISHING AND FISH-CULTURAL OPERATIONS

Mr. David H. Madsen, fish expert of the National Park Service, has been designated liaison officer for this service with the Bureau of Fisheries and State fish and game commissions, and plans are being made for improving fish-planting programs and fishing conditions in the parks. A long-time planting program is being prepared for each park. Special stress is placed upon the policy of not introducing exotics where native species can be maintained.

Arrangements have been made with the State Game Commission of Utah to exchange with the National Park Service a million rainbow eggs, the fish when hatched to be planted in Yellowstone National Park.

Excellent fishing conditions were maintained in the parks in spite of drought conditions and unusually good catches were reported by anglers.

PUBLICATIONS

The serious cut in funds available for printing during the past 2 years, which resulted from the effort to reduce the regular running expenses of the Federal Government, was almost disastrous this

year, with more people than ever visiting the national parks and inquiring about them. The small supplies of circulars it was possible to issue in the spring of 1933 were exhausted early in 1934, and before the close of the 1934 fiscal year field officers were complaining that their supplies of printed information for that year were approaching the point of exhaustion. It is imperative that larger funds for the printing of circulars be made available if the service is to meet the responsibility of furnishing information concerning the Nation's national parks and monuments.

For the first time a separate information circular was printed for General Grant National Park. Formerly the Sequoia and General Grant Parks were treated in the one booklet. A circular also was printed regarding the recently established Death Valley National Monument. Extensive revisions were made in the park booklets and the new offset method, last year adopted for some of the park circulars, extended to all of them. Small editions of information circulars for Platt National Park and the National Capital Parks were issued by the multilith process, as funds were not available for printed booklets. Folders concerning several of the military parks also were issued by this process as an emergency measure.

A reprint edition was issued of the publication entitled "The National Parks and Emergency Conservation," issued last year to acquaint members of park Civilian Conservation Corps camps with park ideals and purposes. It is of especial value at the present time in filling requests for general park information since the publication Glimpses of Our National Parks is exhausted. Copy for a new edition of the latter booklet now is in course of preparation.

A brochure entitled "Wildlife Management in the National Parks", the second in the fauna series, was prepared by George M. Wright and Ben H. Thompson of the Wildlife Division, and will be submitted soon to the printer. Since the first volume of the fauna series was issued in 1932 much has transpired in the field of wildlife management and it is desirable that these matters be presented to the attention of those people who watch with analytical interest the administration of the parks and particularly the welfare of the game animals of the country.

Motorists guides for Glacier, Yellowstone, Yosemite, and Rocky Mountain National Parks were printed by the Geological Survey and the entire editions forwarded to the parks for which issued, for distribution to incoming motorists.

In accordance with a plan to issue pocket-size recreation areas map folders for each of the 48 States and the Territories of Alaska and Hawaii, copy for most of these maps was prepared and maps issued by the multilith process for Colorado, Idaho, and Montana.

VISUAL EDUCATION SERVICE

One of the most effective means of bringing the national parks and monuments to the attention of our people, and one that is limited only by the amount of material available, is through the distribution of motion-picture film and slides. As yet no adequate supply of films has been obtainable, due to lack of funds. It is urgently recommended in this connection that sufficient money be made available to permit the Service to cooperate with university-extension services in furnishing park film and to meet the requests upon it from schools, civic and travel organizations, churches, and clubs for such material.

During the year 333 motion-picture films were borrowed from this office by such organizations. Individuals and organizations also used 7,359 lantern slides and 11,099 pictures from this Service. The large number of pictures withdrawn for use in preparing film strips for distribution to the Civilian Conservation Corps camps and for use in Service publications was not included in this count.

Under the educational program adopted in connection with the Civilian Conservation Corps camps, 1,320 film strips were produced and 550 reels of sound and silent films.

In order to produce a limited supply of colored pictures for use in traveling exhibits and also to place on the walls of Government buildings and in other prominent places where they would serve to call attention to the park areas, an enlarging library also was established under Public Works Authority and enlargements made from national-park negatives.

MATHER MEMORIAL PLAQUES

In accordance with the purpose for which the Stephen T. Mather Appreciation was formed, 25 memorial plaques have been presented to the National Park Service by the Appreciation for placement in national parks and monuments throughout the country as memorials to the first director of the Service. With the exception of 6 plaques, all of these tablets have now been installed and the majority of them dedicated. Three of the unplaced plaques have been sent to General Grant, Hot Springs, and Mount McKinley National Parks, and locations for them are now under consideration by the Branch of Plans and Designs. The three remaining plaques are destined for places of honor in the East, where Mr. Mather did so much to develop the national-park idea. Prior to the establishment of the Great Smoky Mountains National Park in 1931, Acadia was the only national park east of the Mississippi River, where our large centers of population are found. As soon as the Great Smoky Mountains and Shenandoah areas are sufficiently developed, fitting locations will be chosen and the plaques installed and dedicated.

By special congressional authorization, a plaque will be placed in one of the park developments of the Nation's Capital. A site has not yet been chosen, but a location along the proposed George Washington Memorial Parkway near the Great Falls terminus will probably be considered.

WINTER USE

Between-season travel figures for the period from October 1, 1933, to April 30, 1934, show that winter use of the national parks increased phenomenally during the past year, although weather conditions on the Pacific coast were exceptionally mild. In spite of the poor conditions for winter sports that naturally resulted, public interest in these activities actually increased. If this condition was brought about, as Park Service officials believe it was, through the new national attitude toward leisure, the winter of 1933–34 is an indication of what may be expected in the future, and the National Park Service is making careful observations to guide it in developing the parks for widespread winter use.

Yosemite National Park continued to lead the list for winter sports activities and general winter use. The Wawona Road between Yosemite Valley and the Mariposa grove of big trees was kept open for the first time in winter, making the splendid ski fields at Chinquapin accessible. These fields have been classed by experts as among the finest ski slopes in the world. From the middle of December until the end of February special events were scheduled, beginning with the annual Yosemite Winter Club frolic officially opening the winter sports season in the park. The season's program featured ski races, speed skating, hockey, skijoring, sleighing, and dog-team sleds. The fourth annual San Joaquin Valley-Sierra Winter Sports Carnival was held on January 13 and 14. Its success was attested by the largest attendance and the greatest enthusiasm accorded any of the previous carnivals. Travel to Yosemite during the winter period increased 27 percent over that for the year before.

Winter use of Sequoia and General Grant Parks was also marked by a substantial travel increase over the previous winter—37 percent for Sequoia and 120 percent for General Grant. The first winter-sports carnival ever held in Sequoia took place on February 25 at Lodgepole Camp, where conditions for such activities are regarded as among the finest in California. When the road from Giant Forest to Lodgepole is surfaced, it may be expected that the number of visitors will greatly increase. Otto Steiner of the German-Austrian Alpine Association made the first ski trip from Giant Forest to Mount Whitney. He accomplished the 200-mile journey in 5 days and succeeded in getting within a hundred or so feet of the top of the mountain. Overhanging banks of snow whipped by high winds made it unsafe for him to proceed farther on account of falling snow.

Winter sports events have long been a part of the regular schedule in Mount Rainier National Park, known throughout the country as a famous winter resort. Recent developments, including the use of Paradise Valley as the winter playground of the Northwest, materially increased the winter use. Some idea of the popularity of snow sports in this area may be gained from the fact that reservations for accommodations the following winter were made in May and June by over 800 persons living in the cities of the Puget Sound region. Last winter saw the inauguration of the first annual silver skis championship, a 5-mile down-hill race from Camp Muir, 10,000 feet, to Paradise Valley, 5,500 feet. This event, held on April 22, was highly successful and set a new all-time week-end record for the number of cars entering the park during the winter season. The second annual snow-sport carnivals of the Tacoma and Seattle Chambers of Commerce also were highly successful. Winter travel to this park increased 54 percent over the previous season.

Although Lassen Volcanic and Crater Lake National Parks are not open all year, skiing events take place in both areas if conditions permit. A ski tournament attended by more than 1,100 persons was held in Lassen Park on April 8. Crater Lake was open to the traveling public more than 2 months in advance of the usual season, with the result that the number of visitors increased 120 percent.

All the other national parks that are open during the winter experienced marked travel increases over the numbers recorded for the previous year. The exact figures are not available for Acadia and Great Smoky Mountains National Parks, but the indications were that the winter travel was the largest experienced for several seasons. At Carlsbad Caverns, attendance increased 72 percent; at the south rim of the Grand Canyon, 56 percent; Hawaii, 288 percent; Hot Springs, 37 percent; Rocky Mountain, 45 percent; Zion, 90 percent; Wind Cave, 106 percent; and Platt National Park, 7 percent.

PROTECTION OF PARK FORESTS

Again during the fiscal year 1934 there was a notable expansion in the forestry work of the National Park Service, with the result that headquarters for that work were transferred to Washington under a new branch of forestry. Field headquarters for the western division of the Service were continued at Berkeley, Calif.

Part of the increase in forestry activities resulted from the reorganization of the national park and monument system effected under Executive order last August. By far the greater part of its activities, however, were in connection with the Emergency Conservation Work program for the national parks and monuments.

The forest protection and fire prevention allotment of the regular appropriation act for the fiscal year 1934 provided only very limited

allotments to the parks for essential fire-protection personnel and equipment. All forest protection improvements, insect and tree disease control work, and type mapping accomplished during the fiscal year were financed from the emergency appropriation, either under Emergency Conservation Work or Public Works. The forest protection accomplishments of the past year are, therefore, largely represented in the reports of the Emergency Conservation Work and Public Works programs.

Forest fire protection.—The presence of the Emergency Conservation Work camps within the national parks and monuments was of immense assistance as a fire protection measure through the availability and use of the Civilian Conservation Corps enrollees for fire patrol and fire suppression service.

Great Smoky Mountains National Park, with 2,588 acres burned over, and Yellowstone National Park, with 2,187 acres burned, were the greatest sufferers from forest fires during the season of 1933. While Glacier National Park had only 31 acres burned over within the park boundaries, its fire suppression expenditures were the largest by reason of suppression of a 2,400-acre fire immediately adjacent, which for a time seriously threatened the park but fortunately was controlled before crossing its boundaries.

A copy of the annual fire statistics for the calendar year 1933 may be found in the statistical section, on page 370.

Insect control.—The successful insect control work of the preceding years in Mount Rainier, Crater Lake, and General Grant National Parks has been maintained by follow-up work this past spring.

Insect control in Yellowstone National Park was confined to work along the park highways, in and adjacent to camp grounds, and to the white bark pine stand of the Mount Washburn region. The magnitude of the infestation in the lodgepole stands of the national forests adjacent to Yellowstone and Grand Teton National Parks and the great difficulties encountered in attempting to secure control, as well as the immense expenditure which would be required, made it necessary to forego the attempt for control of this lodgepole infestation in the so-called "Yellowstone project."

The most important insect control operations of the past year were undertaken in the magnificent forests of Sequoia and Yosemite National Parks, the largest operation having been centered in Yosemite National Park for the protection of the ponderosa and sugar pine stands.

Blister rust.—Blister rust control operations continued in Acadia and Mount Rainier National Parks and were initiated in selected white pine areas within the proposed Shenandoah National Park. In all three parks this work was accomplished by Civilian Conserva-

tion Corps enrollees under the Emergency Conservation Work program.

Type mapping.—Type mapping projects with special crews were carried on during the summer of 1933 in Glacier and Yellowstone National Parks. In many of the other national parks this activity was carried on through the assignment of regular members of the park organizations or through the use of Emergency Conservation Work personnel.

Fire equipment.—The most important additions to the fire protection equipment of the national parks were provided through the purchase of 4 fire trucks, each equipped with a 250-gallon water tank and booster pump, for forest fire suppression in Sequoia, Yosemite, Mount Rainier, and Glacier National Parks, and 1 truck primarily for fire protection for buildings at the south rim of the Grand Canyon.

Fire protection for buildings.—A fire protection engineer was added to the staff of the branch in order that the greatly increased number of building plans under the expanded emergency program might receive careful examination from the standpoint of fire protection provisions, and also that greater cooperation might be given the parks in the various phases of protection of buildings. Several field trips have been made by him for the purpose of making examinations and recommendations in regard to fire protection for buildings in national parks and monuments. Additional surveys of this character are planned.

Tree surgery and tree care.—With the addition of the military and historical parks and monuments, cemeteries, and National Capital Parks to the national park system an important phase of forestry work developed. In the intensively used portions of these areas, each individual tree is of importance and must be given consideration from the standpoint of pruning, feeding, cabling, girdling, root removal and, in special cases, cavity work. Work of this character has been supervised and inspected during the past year in nine military parks and cemeteries and in the National Capital Parks; and a tree census and sketch map have been prepared of all trees in 11 national cemeteries and monuments.

SANITATION IN THE PARKS

Last year, as during the past dozen years, the Public Health Service continued its cooperation in supervising matters of sanitation in the national parks and monuments of the West through its sanitary engineers stationed in San Francisco. Approximately 410 bacteriological and 60 chemical analyses were made in the Public Health Service laboratory in San Francisco of samples of water from various

sources of water supplies in the parks and monuments, to guard against contamination.

Under a new arrangement during 1934 district park rangers were assigned the duty of making general inspections of hotels, lodges, housekeeping cabins, stores, mess houses, all other places handling or serving food products or beverages, and swimming pools. These district rangers consulted with the sanitary engineers and received advice and assistance on special or unusual problems of sanitation.

In three of the larger national parks experienced employees devote all their time to supervision, operation, and maintenance of water-supply systems, incinerators, sewage-disposal plants, swimming pools, comfort stations, mosquito control, and other activities pertaining to sanitation. Conditions in these parks have made evident the importance of having in every park one well-trained employee whose primary duties are supervision and maintenance of water supplies, sewage and garbage disposal, and comfort stations, and cleaning of camp grounds.

Expansion of the national-park system in the East has brought up many new problems of sanitation, as has the transfer to the jurisdiction of the National Park Service of the National Capital parks and a number of public buildings in the District of Columbia. The Public Health Service has extended its cooperation to these new activities.

ENGINEERING AND LANDSCAPE ACTIVITIES

Under the various emergency appropriations made available to the National Park Service, as outlined elsewhere, an unusually large amount of construction work of various types was undertaken. More designs, working drawings, specifications, and estimates for park building construction were demanded, and more landscape layouts and planting plans for building groups, roadsides, and special areas in connection with such construction. Approval of the construction of scenic parkways on a scale hitherto undreamed of have required most careful supervision from engineering and landscape planning angles. The administration by the Service of a group of buildings outside of the national parks created a new field of activity for both architects and engineers.

So heavy was the pressure of work that in addition to utilizing the Service's force of engineers, architects, and landscape architects to the utmost, it was necessary in several cases to secure consultants' services for brief periods, such as in the extension to the executive wing of the White House.

Through availability of Public Works funds plans for three unusually large park buildings were prepared—a $130,000 utility building in Yosemite and an apartment house and a utility building in Yellowstone, each at $120,000. Construction of the $100,000 apart-

ment house for employees at the Navy radio station on Schoodic Point in the Acadia National Park also required careful supervision, although in this case also the services of expert consulting architects were utilized. An unusually interesting project under construction at the close of the fiscal year is the four buildings comprising the Swan Tavern group, a reconstruction of the colonial hostelry at Yorktown, Va., in the Colonial National Monument, which disappeared during the Civil War.

PARKWAY PROJECTS

Following announcement last November by the Public Works Administration of approval by the President of a parkway project to connect the Shenandoah and Great Smoky Mountains National Park areas, and the allotment of funds for initiation of the work, extensive field explorations were made of the 500-mile distance involved. Advocates of many routes were interviewed and due consideration given construction feasibility and landscape conservation. Joint reports by landscape architects and the engineering experts were prepared and submitted to the Secretary on June 13. With funds allotted and portion of the route approved, the work will proceed expeditiously. To date $6,010,000 has been allotted for surveys, plans, and construction of this parkway.

Also last November the sum of $50,000 was allocated to the Service for the study of a parkway through the Green Mountains of Vermont. A special group has been studying various aspects of the problem and soon will submit its report.

Preliminary studies also were made of the proposed Natchez Trace Parkway.

PARK ROAD DEVELOPMENT

As in past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction in all areas administered by the National Park Service, with the exception of Mount McKinley National Park, Alaska, where road work has continued to be performed satisfactorily by the Alaska Road Commission.

The cooperative arrangement with the Bureau of Public Roads, as in former years, has been productive of noteworthy accomplishment under the direction of Thomas H. MacDonald.

There have been constructed, reconstructed, and improved to date (cleared, graded, and surfaced) 695.44 miles of roads. In addition, work in various stages of construction includes 493.11 miles of clearing and grading, and 521.79 miles of surfacing. Considerable progress has been made on construction of adequate trail systems, $1,998,-847.43 having been expended on the construction of 780.48 miles of trails built on suitable standards of grade and alinement.

HISTORIC AMERICAN BUILDING SURVEY

Especially noteworthy from both historic and architectural standpoints was the historic American buildings survey, previously mentioned as a Civil Works project. The purpose of the survey was to secure exact physical records of antique buildings, important historically or architecturally. While this project was not without some good local precedent, it was the first time that such a national program ever had been carried into effect.

The program attracted a great deal of public attention and the results were gratifying in the extreme. About 5,000 sheets portraying 900 buildings were submitted through this Service to the Fine Arts Division of the Library of Congress. The drawings covered a vast range of subjects, from Indian pueblos to New England watermills, and will form a valuable part of the archives of American social history.

While a vast amount of material was gathered, it represents only a fragment of the work that should be done. It is hoped that financial means may be found to continue this historic buildings survey on an active basis.

APPROPRIATIONS, DONATIONS, AND REVENUES

During the fiscal year 1934 the National Park Service was operated with funds supplied by direct appropriation acts, by amounts transferred from various appropriations for part-year operation of activities over which jurisdiction was formerly exercised by other governmental agencies, and by Public Works, Emergency Conservation Work, and Civil Works Administration allotments.

DIRECT APPROPRIATIONS, 1934 FISCAL YEAR

In the Interior Department Appropriation Act for the fiscal year 1934, the $5,072,790 appropriated included $2,435,700 for road and trail construction. However, as $1,265,260 for administrative reductions was required by the Bureau of the Budget, the amount actually available for expenditure was reduced to $3,807,530.

The Second Deficiency Act, 1933, appropriated $180,000 but after providing for administrative reductions of $45,000, in compliance with the Bureau of the Budget requirements, $135,000 actually remained available for expenditure.

The Emergency Appropriation Act, 1935, included $13,000 for salaries and expenses for part-year administration, protection, and maintenance of public buildings outside the District of Columbia. The Independent Offices Appropriation Act, 1934, appropriated $10,000 for the Mount Rushmore National Memorial Commission, $8,800 for the Commission of Fine Arts, and $96,650 for the George

Rogers Clark Sesquicentennial Commission, in addition to the $250,000 authorized for the latter Commission in the Fourth Deficiency Act, 1933.

Funds transferred, 1934 fiscal year.—A total of $4,685,609.15 was transferred for part-year operation of those activities which were transferred to the National Park Service under the Executive orders of June 10 and July 28, 1933.

Allotments from no-year appropriations.—In addition to the foregoing, Public Works Administration, Emergency Conservation Work, and Civil Works Administration funds were allotted, as follows:

Public Works, 1934–35

Construction of roads and trails	$26, 884, 144. 00
Construction of physical improvements	7, 232, 456. 27
Total	34, 116, 600. 27

Emergency Conservation Work

(Procurements from Apr. 22, 1933, to May 31, 1934)

National parks	$4, 641, 281. 00
State parks	11, 582, 725. 00
General Land Office	32, 470. 00
Territory of Hawaii	299, 885. 00
Reclamation Service	19, 870. 00
Soil erosion	218, 740. 00
Total	16, 794, 971. 00

Civil Works Administration

(Period Nov. 28, 1933, to Apr. 28, 1934)

Labor cost	$1, 988, 960. 33
Other than labor cost	425, 105. 13
Administrative cost	76, 612. 60
Total	2, 490, 678. 06

DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1934, amounted to $285,979.77. The donations were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditures of Federal appropriations. In the 1933 fiscal year cash donations amounted to $299,902.13.

REVENUES

The revenues received during the fiscal year 1934 amounted to $731,331.80, as compared with revenue receipts of $628,182.06 in the 1933 fiscal year.

Direct appropriations, 1935 fiscal year.—For the fiscal year 1935 there has been appropriated $12,461,513. Of this amount $6,319,640 was authorized in the Interior Department Appropriation Act, 1935; $5,325,000 in the Emergency Appropriation Act, 1935, for the construction of roads and trails; and $816,873 was made available in the District of Columbia Appropriation Act, 1935.

USE OF RADIO TELEPHONES IN NATIONAL PARKS

The highly satisfactory use of radio telephones over a 3-year period in Mount Rainier National Park, for fire protection and emergency administrative purposes, has resulted in the general adoption of this method of communication in many of the other parks.

Last winter Director Fechner approved the expenditure of Emergency Conservation Work funds, amounting to $15,000, for the purchase of radio equipment for Glacier, Yellowstone, and Great Smoky Mountains National Parks. This equipment is now being installed.

Radio communication was also introduced during the past year in Yosemite, Rocky Mountain, and Grand Teton. Radio communication was particularly effective at Death Valley last winter in connection with the Civilian Conservation Corps camp operations and administration, as no other means of communication was available. Estimates have been made for installations in Sequoia and Grand Canyon National Parks.

The radio sets used generally are of three sizes. The 50-watt headquarters set can transmit voice communication with sufficient strength to insure reception by the small portable sets used on the fire-fighting line. This larger set can likewise receive and amplify the weak signals from the smaller sets. The semiportable sets are rated at 1-watt capacity and weigh approximately 150 pounds. These are used at district ranger stations and at fire look-out stations. The small portable sets weigh approximately 15 pounds and have a normal sending and receiving range of 10 to 20 miles. These can also be used at remotely situated construction camps when no telephone communication is available.

Radio communication is not intended to duplicate the telephone system but is to be used in extending the means of communication to points requiring this service where telephone line installations are prohibitive as to cost of construction and maintenance.

MAINTENANCE OF FEDERAL BUILDINGS

At the close of the fiscal year 98 buildings, aggregating more than 12,000,000 square feet, and 7 memorials in the District of Columbia were being maintained and operated by the buildings branch of the National Park Service. Outside the District, 9 buildings with a total

floor space of over 400,000 square feet were being maintained and operated.

Regular work, supplemented by civil-works and public-works projects and other special jobs, incident to the proper maintenance, operation, and protection of buildings and memorials both within and without the District of Columbia, was performed. The creation of emergency governmental activities and the relocation of a number of bureaus caused a large amount of interior alterations, such as installation of partitions, buzzer systems, special laboratory equipment, and painting.

Forty public-works projects, involving allotments totaling a little more than $2,000,000, were undertaken. These improvements included repair of the White House and Washington Monument, restoration work on the Lee Mansion in Arlington Cemetery, addition of a seventh floor to the Interior Department Building, and extensive installations of air-cooling and automatic sprinkler systems in the large Federal buildings.

SPACE CONTROL ACTIVITIES

The transfer of the functions of the former Public Buildings Commission to the National Park Service necessitated the creation under the branch of buildings of a Division of Government Space Control. This division maintains records of occupancy and availability of space in Federal or leased buildings, as well as buildings available for leasing for Government use in the District of Columbia.

During the past year 119 leases, involving nearly $1,500,000, have been made, authorized, or renewed. The space allotments for the new Post Office, Interstate Commerce Commission, Justice, and Labor Buildings have been planned, and 201 moves, costing $75,800.65, have been made.

While several monumental buildings have been erected in Washington, principally under authority of the Public Buildings Act of May 25, 1926, the Government is still inadequately and improperly housed. If the Federal rent bill maintains its present level, a building containing a million square feet of floor space, almost equal in size to the Department of Commerce Building, could be paid for in 17 years. Such a building would accommodate practically all Federal offices now in rented quarters, and would be a permanent investment of the Government.

As very little relief from congested quarters has been obtained by the use of completed new Federal buildings, and as there still is a justifiable demand for additional buildings for departments not yet adequately housed, it would appear appropriate for the National Park Service to formulate plans for the next step in the general public buildings program for Washington, and make the appropriate recommendations to Congress.

ACCOMMODATIONS FOR THE PUBLIC FURNISHED BY PRIVATE CAPITAL

Services to the public in the way of lodging, meals, transportation, various types of stores, and similar accommodations continued to be operated by private capital either under long-term contract or annual permit, depending upon the amount of capital involved and the type of service rendered.

The increased travel to the national parks, both by rail and by private car, had a very noticeable effect on the volume of business handled by park operators in the western national parks.

During the past fiscal year there was a break in the steady decline that had continued in the operators' business since 1929; and it is gratifying to report that figures available at this time show an increase in such business over last year of slightly in excess of 51 percent. A particularly pleasing phase of this better state of affairs is that the improvement has been general throughout the national parks.

The wisdom of the concessionaire system has been fully demonstrated during the 5 years since 1929, for during that period of depressed conditions the usual high standards of service were furnished by operators of public accommodations, and in many instances at substantially lower rates. Officials of the National Park Service are convinced that under any other policy of operation a break-down of service would have occurred during that losing period, with an inevitable deluge of complaint and criticism from the public.

The plan inaugurated a year ago under which the utility operators, with the approval of the respective park superintendents and the director, were authorized to offer new facilities and to make changes in existing service during the season was continued. The operators took advantage of this opportunity primarily to make experimental changes in service in an effort to determine what the public really wants. Continuation of this policy will have an important influence on the types of new accommodations to be installed and on decisions to be made regarding permanent changes and inprovements in existing service.

With the expansion of the National Park Service by transfer of the military and other areas added last year, the number of park operators increased greatly. At the present time there are 85 privately capitalized enterprises operated in areas under the jurisdiction of the Service, varying in size and scope of activities from small stores in isolated areas to large hotels and transportation companies in the larger parks.

Plans for the extension of such facilities into the Great Smoky Mountains National Park and other eastern areas soon to be given national park status were given careful consideration during the past

year. Various agencies have evinced an interest in obtaining preferential right to provide and operate the facilities deemed necessary in those areas and the National Park Service will be ready to submit recommendations regarding operating contracts well in advance of the need of the accommodations to be furnished thereunder.

Under an agreement reached with the National Recovery Administration the operators of public utilities in the national parks were exempt from compliance with the N.R.A. codes, subject to regulations by the Department of the Interior of minimum wage and maximum hours requirments. This agreement was reached upon showing by the park operators that, being subject to the rules and regulations of the Department in all matters pertaining to rate structures, services, and character of facilities furnished under their respective contracts, complete control of their operations should be centralized in that one agency of the Federal Government.

Rules and regulations governing the hours of labor and wages of employees as contemplated under that agreement were approved March 31, 1934.

No general conference of park operators was held in Washington during the past year, but several special conferences were called in the West early in the year for consideration of problems, including the relation of their national-park activities to the National Recovery Administration.

A special meeting of National Park Service officials and park operators was held at Grand Canyon National Park from May 1 to May 5 for the purpose of making a study of the type of service and range of accommodations that should be installed in the national parks, particularly in the public camp grounds, and of the minimum standards to be established for architecture, construction, fire prevention, and sanitation. While the meeting had special reference to the situation at the Grand Canyon, where comprehensive plans are under way for the development of facilities as soon as improved business conditions warrant, the basic policies adopted will be applied to similar problems in all the national parks.

CONCLUSION

In concluding this report, grateful acknowledgments are made of the assistance furnished the National Park Service last year by a great number and wide variety of organizations and individuals.

First of all, appreciation is due the Secretary of the Interior, the Assistant Secretary in charge of national-park policies, and other officers of the Department of the Interior for their ever-ready support of national-park policies and ideals, and their assistance in promoting the welfare of the national-park and monument system; and to Mem-

bers and committees of Congress and officers of the Bureau of the Budget for their sympathetic understanding of national-park affairs.

Bureaus of the Department of the Interior have cooperated fully in furnishing scientific advice and assistance, as have other bureaus throughout the Government service. Civic organizations, the press, universities and colleges, broadcasting companies, railroads and other industrial concerns, and civic-minded individuals are on the long list of those who have furthered the cause of national park use and advancement. The list of those cooperating is too long to print, but all who have assisted have the satisfaction of knowing that they have added to the well-being of America and Americans by promoting national-park protection and use.

Cooperation in the emergency relief program has been mentioned elsewhere. But another word is not amiss here as to the value of that work to our national parks and monuments and the visiting public and as to the gratification of the National Park Service in being one of the Federal agencies privileged to assist in the tremendous relief work.

To the personnel of the Service, field and office, the highest commendation is due. It has met, with efficiency and fine enthusiasm, the complex problems and abnormal amount of work involved in the extraordinary expansion programs of the year.

Attention again is directed to the increased winter use of the national parks. The people of the United States are awakening to the health and recreational value of winter sports, and the national parks of the North and West offer exceptional advantages for such sports. Efforts will be made this fall and winter to stimulate their winter-time use through dissemination of information as to their accessibility and superlative snow conditions.

With plans for expanded use of the national parks and monuments and for improved service in all lines of endeavor, the National Park Service faces the fiscal year 1935 with high hopes and unbounded enthusiasm.

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NATIONAL PARKS TABLE 1.—*Holdings acquired for national park and monument purposes*

Parks and monuments	Holdings acquired from July 1, 1933, through June 30, 1934							
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase		Total area acquired in acres	Holdings acquired prior to July 1, 1933, in acres	Total holdings acquired through June 30, 1934, in acres
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park				(1)	1,520.13	1,520.13	12,312.11	13,832.24
Aztec Ruins National Monument							25.88	25.88
Black Canyon of the Gunnison National Monument				(1)	105.00	105.00		105.00
Carlsbad Caverns National Park							441.00	441.00
Chaco Canyon National Monument				(2)	3,832.56	3,832.86		3,832.86
Colonial National Monument	$85,000.00	$80,000.00	921.73			921.73	3,322.57	4,244.30
Crater Lake National Park							1.00	1.00
Craters of the Moon National Monument	800.00		80.00			80.00	240.00	320.00
Fredericksburg and Spotsylvania National Historical Park	1,867.93		483.50			483.50	1,929.87	2,413.37
General Grant National Park							20.00	20.00
George Washington Birthplace National Monument							483.70	483.70
Glacier National Park							3,836.86	3,836.86
Grand Canyon National Park							19,228.94	19,228.94
Great Smoky Mountains National Park	944,393.58	506,557.86	65,563.00	(1)	30,805.65	96,368.65	297,719.70	394,088.35
Hawaii National Park							156,800.00	156,800.00
Hot Springs National Park							16.00	16.00
Lassen Volcanic National Park							40.00	40.00
Mesa Verde National Park							350.20	350.20
Muir Woods National Monument							426.43	426.43
Petrified Forest National Monument				(2)	640.00	640.00	3,194.00	3,830.00
Pinnacles National Monument							1,926.27	1,926.27
Rocky Mountain National Park	56,585.00	56,585.00	297.21			297.21	4,798.93	5,096.14
Scotts Bluff National Monument							162.08	162.08
Sequoia National Park							3,294.25	3,294.25
Wind Cave National Park							100.77	100.77
Yellowstone National Park	3,250.00	3,250.00	851.99			851.99	2,414.08	3,266.07
Yosemite National Park							27,462.89	30,547.48
Zion National Park				(1)	5.03	5.03	1,556.36	1,561.39
Yucca House National Monument							9.60	9.60
Total	1,091,896.51	646,392.86	68,197.43		36,908.37	105,106.10	542,113.49	650,300.18

[1] Donation.

[2] Exchange.

NATIONAL PARKS TABLE 2.—*Automobile and motorcycle licenses issued during seasons 1930–34*

Name of park [1]	1930		1931		1932		1933		1934	
	Automobiles	Motorcycles	Automobiles	Motorcycles	Automobiles	Motorcycles	Automobiles	Motorcycles	Automobiles	Motorcycles
Crater Lake	37,595	10	35,716	51	29,637	------	19,924	------	18,521	------
General Grant	7,199	------	7,397	------	5,900	------	6,199	------	7,992	------
Glacier	10,498	7	11,362	------	10,712	11	8,955	10	12,146	18
Grand Canyon	33,780	------	36,797	------	32,651	------	30,104	------	28,721	------
Lassen Volcanic [2]	------	------	------	------	4,803	3	4,924	9	6,859	7
Mesa Verde	4,599	------	4,863	------	4,382	------	4,262	------	3,947	------
Mount Rainier	35,498	28	41,217	16	44,719	------	31,903	------	32,095	------
Sequoia [3]	20,998	------	21,802	------	18,304	------	17,045	------	17,401	------
Yellowstone	63,853	187	56,401	176	52,597	155	38,580	46	44,886	170
Yosemite	81,365	186	76,678	175	67,482	129	61,742	118	64,055	124
Zion	10,284	------	15,754	------	12,967	------	12,194	------	14,352	------
Total	305,669	418	307,987	418	284,154	298	235,832	183	250,975	319

[1] No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.
[2] No license required prior to 1932 fiscal year.
[3] License required only for Giant Forest Road.

Licenses not required in certain parks because of small road mileage or unimproved condition of roads (see footnote 1). Licenses also not required for travel on unimproved roads in other parks. No charge for license issued for operating cars on official business.

NATIONAL PARKS TABLE 3.—*Receipts collected from automobiles and motorcycles during seasons 1930–34*

Name of park [1]	1930	1931	1932	1933	1934
Crater Lake	$37,623.00	$35,803.00	$29,687.00	$19,924.00	$18,521.00
General Grant	3,599.50	3,698.50	2,950.00	3,099.50	3.996.00
Glacier	10,506.00	11,362.00	11,092.00	8,965.00	12,164.00
Grand Canyon	33,988.00	36,950.00	32,764.00	30,104.00	28,721.00
Lassen Volcanic [2]	----------	----------	5,778.50	4,928.50	6,862.50
Mesa Verde	4,644.00	4,917.00	4,396.00	4,262.00	3,947.00
Mount Rainier	35,526.00	41,233.00	44,719.00	31,903.00	32,095.00
Sequoia [3]	20,998.00	21,802.00	18,304.00	17,045.00	17,401.00
Yellowstone	192,218.00	169,379.00	156,537.00	115,786.00	134,828.00
Yosemite	162,784.00	153,531.00	135,831.00	123,602.00	128,234.00
Zion	7,521.00	15,400.00	12,976.00	12,194.00	14,352.00
Total	509,407.50	494,075.50	455,034.50	371,813.00	401,121.50

[1] No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.
[2] No license required prior to 1932 fiscal year.
[3] License required only for Giant Forest Road.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* [1]

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1928	$37,940.00	$37,376.99	
1929	39,000.00	40,014.00	
1929 (deficiency)	1,355.00		
1930	52,600.00	48,701.52	
1931	59,900.00	56,984.42	
1932	61,600.00	[2] 59,892.14	
1933	59,400.00	57,602.08	$10.00
1934	55,000.00	37,644.00	220.06
1935	41,470.00		
Bryce Canyon:			
1930	26,100.00	21,580.01	
1931	13,700.00	13,700.00	
1932	20,000.00	[2] 19,257.50	
1933	14,800.00	12,455.43	
1934	13,790.00	7,211.00	
1935	10,490.00		
Carlsbad Caverns National Park:			
1928	30,000.00	28,492.84	55,682.00
1929	70,000.00	63,490.00	84,983.45
1929 (deficiency)	260.00		
1930	100,000.00	[1] 103,271.01	136,241.78
1931	165,600.00	124,220.75	143,779.55
1932	150,100.00	[2] 130,162.62	113,677.43
1933	128,800.00	[4] 135,687.63	77,236.57
1934	68,330.00	49,356.00	89,730.54
1935	52,330.00		
Crater Lake:			
1928	63,590.00	62,382.53	22,927.69
1929	47,100.00	[3] 61,464.00	24,318.22
1929 (deficiency)	850.00		
1930	59,800.00	67,938.75	38,023.70
1930 (deficiency)	12,000.00		
1931	[3] 73,300.00	73,551.96	35,843.15
1932	106,900.00	106,753.64	29,687.00
1933	90,000.00	86,554.37	19,924.00
1934	63,479.00	53,838.00	18,937.35
1935	49,965.00		
General Grant:			
1928	13,650.00	13,529.26	3,488.90
1929	15,650.00	15,802.00	3,305.70
1929 (deficiency)	500.00		
1930	15,650.00	15,448.14	3,868.28
1931	15,860.00	15,841.07	3,989.95
1932	21,900.00	21,881.86	3,973.22
1933	21,900.00	20,913.85	3,437.16
1934	15,000.00	10,771.00	4,459.92
1935	11,750.00		
Glacier:			
1928	163,300.00	162,525.28	14,652.59
1929	188,200.00	191,061.00	18,436.18
1929 (deficiency)	5,065.00		
1930	219,400.00	215,726.91	22,146.16
1931	227,000.00	223,956.32	17,866.46
1931 (deficiency)	9,550.00		
1932	256,500.00	[2] 246,002.11	17,495.56
1933	226,200.00	224,744.51	12,006.64
1934	201,803.00	143,724.00	16,235.36
1935	153,435.00		
Grand Canyon:			
1928	128,760.00	128,268.33	46,097.43
1929	169,000.00	151,813.00	49,078.33
1929 (deficiency)	3,540.00		
1930	145,000.00	141,389.56	55,684.46
1931	153,600.00	[3] 171,670.11	51,497.05
1932	172,200.00	[2] 168,106.43	40,221.18
1933	150,000.00	142,656.15	32,933.93
1934	135,890.00	91,520.00	31,139.42
1935	102,400.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* [1]—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Grand Teton:			
1929			$25.00
1930			70.00
1931	$30,700.00	$29,048.47	20.00
1932	76,750.00	[2] 73,180.80	73.80
1933	29,900.00	26,243.06	45.00
1934	20,000.00	12,650.00	68.22
1935	15,620.00		
Great Smoky Mountains:			
1930-31 (deficiency)	30,000.00	25,193.31	76.00
1932	30,000.00	[2] 29,682.77	5,220.55
1933	30,000.00	27,959.52	5,140.69
1934	28,430.00	17,024.00	4,795.00
1935	22,270.00		
Hawaii:			
1928	18,250.00	18,119.10	1,450.00
1929	21,500.00	21,070.00	1,477.00
1929 (deficiency)	785.00		
1930	27,400.00	25,700.05	1,532.52
1931	35,800.00	35,439.55	1,500.00
1932	54,600.00	54,594.06	1,493.41
1933	51,100.00	50,095.20	482.46
1934	48,079.00	32,658.00	475.00
1935	37,125.00		
Hot Springs:			
1928	69,800.00	67,433.19	47,695.50
1929	68,000.00	71,970.00	47,930.90
1929 (deficiency)	6,320.00		
1930	70,900.00	69,173.28	47,931.33
1931	218,500.00	194,760.18	50,467.80
1932	89,300.00	[2] 86,110.72	43,243.22
1933	87,700.00	82,359.03	38,263.90
1934	82,680.00	58,979.00	30,456.00
1935	64,330.00		
Lassen Volcanic:			
1928	15,625.00	15,448.52	167.84
1929	22,400.00	22,688.00	34.36
1929 (deficiency)	460.00		
1930	25,300.00	25,061.16	3,089.55
1931	30,500.00	29,007.20	51.59
1932	50,300.00	[2] 49,774.20	5,778.50
1933	45,100.00	43,310.99	4,980.96
1934	28,334.00	20,003.00	6,953.94
1935	22,635.00		
Mesa Verde:			
1928	50,750.00	48,343.59	3,342.80
1929	83,000.00	[3] 78,134.00	4,719.00
1929 (deficiency)	1,115.00		
1930	57,000.00	53,910.66	4,870.62
1931	96,800.00	[4] 95,799.70	5,411.27
1932	57,300.00	[2] 55,724.49	5,011.75
1932 (deficiency)	22,000.00	[4] 91,693.26	4,750.50
1933	72,900.00		
1934	52,509.00	39,654.00	4,224.50
1935	41,535.00		
Mount McKinley:			
1928	22,000.00	21,314.12	63.04
1929	35,900.00	[3] 36,165.00	1.00
1929 (deficiency)	740.00		
1930	40,000.00	37,680.26	213.18
1931	46,700.00	42,686.45	292.00
1932	31,100.00	28,157.21	129.66
1933	35,600.00	32,165.49	25.00
1934	28,480.00	20,642.00	25.00
1935	22,270.00		
Mount Rainier:			
1928	108,000.00	105,447.74	32,495.50
1929	141,000.00	[3] 141,285.00	39,233.17
1929 (deficiency)	3,370.00		
1929-30 (deficiency)	2,500.00	125,214.00	41,530.31
1930	122,600.00		
1931	180,900.00	174,823.33	46,034.89
1932	195,000.00	[2] 263,233.48	48,793.27
1931-32 (deficiency)	71,000.00		
1933	227,100.00	214,501.02	33,506.96
1934	143,884.00	103,795.00	34,158.65
1935	109,505.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* [1]—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
National Capital Parks:			
1934	$787,000.00	$778,839.00	[7] $24,086.97
1935	816,873.00		
Platt:			
1928	13,050.00	12,991.87	77.16
1929	18,000.00	19,053.00	33.05
1929 (deficiency)	1,080.00		
1930	16,200.00	16,178.70	
1931	18,500,00	18,269.14	
1932	35,900.00	[2] 35,506.83	
1933	31,600.00	30,333.10	
1934	28,520.00	16,382.00	
1935	19,150.00		
Rocky Mountain:			
1928	97,620.00	95,612.07	924.12
1929	95,500.00	[3] 95,230.00	1,537.07
1929 (deficiency)	2,380.00		
1930	96,000.00	94,871.34	4,471.24
1931	105,950.00	104,880.57	448.45
1932	118,800.00	[2] 117,909.55	749.58
1933	114,300.00	111,361.48	1,046.41
1934	98,007.00	75,305.00	409.29
1935	75,145.00		
Sequoia:			
1928	109,000.00	108,863.10	35,105.83
1929	113,000.00	[3] 114,626.00	30,753.00
1929 (deficiency)	3,440.00		
1930	130,000.00	130,056.49	33,934.54
1931	113,100.00	111,513.95	35,694.49
1932	156,900.00	156,713.93	33,010.38
1933	131,800.00	129,146.15	30,189.77
1934	113,317.00	86,483.00	34,164.96
1935	88,475.00		
Shenandoah (proposed):			
1934	[6] 80,000.00		
1935	27,680.00		
Wind Cave:			
1928	10,850.00	11,500.00	12,725.50
1929	11,000.00	11,744.00	13,178.17
1929 (deficiency)	760.00		
1930	13,500.00	13,442.51	16,715.01
1931	54,900.00	46,271.94	11,968.43
1932	25,200.00	[2] 68,074.68	7,258.68
1931-32 (deficiency)	50,000.00		
1933	20,600.00	20,345.64	5,056.19
1934	18,160.00	13,386.00	4,239.97
1935	14,020.00		
Yellowstone:			
1928	400,000.00	[3] 399,150.00	251,663.11
1929	434,000.00	[3] 443,230.00	289,388.95
1929 (deficiency)	12,230.00		
1930	453,000.00	463,306.47	317,238.17
1930 (deficiency)	17,000.00		
1931	501,275.00	500,026.39	259,723.33
1932	560,800.00	[2] 536,739.83	228,644.39
1933	530,800.00	497,681.85	149,853.87
1934	466,309.00	323,592.00	164,699.05
1935	350,265.00		
Yosemite:			
1928	301,000.00	[4] 257,363.73	276,438.20
1928 (deficiency)	15,000.00		
1929	387,250.00	[3] 449,159.00	237,166.90
1929 (deficiency)	14,385.00		
1930	412,360.00	[4] 390,204.38	280,355.45
1930 (deficiency)	5,381.00		
1931	510,100.00	574,302.64	260,805.28
1931 (deficiency)	32,500.00		
1932	558,600.00	[2] 535,376.25	222,629.17
1933	401,200.00	389,523.19	196,319.94
1934	335,309.00	205,227.00	221,960.83
1935	251,845.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* [1]—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Zion:			
1928	$30,900.00	$30,737.69	$3,106.50
1929	38,000.00	40,569.00	3,576.50
1929 (deficiency)	3,295.00		
1930	38,300.00	[3] 42,290.11	7,724.01
1931	33,200.00	[3] 32,589.60	15,500.50
1932	54,100.00	[2] 53,145.65	13,067.30
1933	46,600.00	45,451.53	12,194.00
1934	47,440.00	32,646.00	14,539.35
1935	35,940.00	----------	----------
George Washington B.P. National Monument:			
1930 (deficiency)	996.18	987.71	----------
1930–31 (deficiency)	80,000.00	78,782.34	----------
1931	2,500.00		
1932	26,500.00	[2] 26,050.83	1.00
1933	25,800.00	22,661.61	20.00
1934	21,250.00	11,468.00	----------
Colonial National Monument:			
1931–32 (deficiency)	135,000.00	[2] 132,648.99	299.95
1933	72,000.00	53,615.41	504.92
1934	52,030.00	38,711.00	483.34
Protection of National Monuments:			
1928	25,000.00	24,042.56	132.00
1929	35,000.00	35,951.00	97.00
1929 (deficiency)	1,225.00		
1930	46,000.00	[4] 42,634.76	100.00
1931	83,900.00	71,598.75	269.60
1931 (deficiency)	3,000.00		
1932	165,400.00	[4] 147,585.89	195.19
1933	93,800.00	[4] 86,978.64	252.05
1934	89,060.00	57,457.00	185.03
1935	82,760.00	----------	----------
National Historical Parks and Monuments:			
1935	77,350.00	----------	----------
National Military Parks, Battlefields, and Cemeteries:			
1934	229,883.00	135,464.00	306.67
1935	160,030.00	----------	----------
National Military Monuments:			
1934	36,223.00	25,658.00	575.00
1935	33,770.00	----------	----------
National Park Service:			
1928	57,100.00	57,047.56	20.10
1929	70,200.00	[3] 75,714.00	----------
1929 (deficiency)	4,660.00		
1930	80,830.00	81,864.36	.25
1931	117,000.00	115,859.20	----------
1932	167,400.00	165,299.20	----------
1933	174,620.00	174,547.94	1.14
1934	160,000.00	143,069.00	10.00
1935	148,390.00	----------	----------
Public Buildings and Grounds:			
1934	3,479,193.00	3,396,605.00	23,774.23
1935	4,078,590.00	----------	----------
Arlington Memorial Bridge:			
1934	198,000.00	57,025.00	----------
Addition to Executive Office building:			
1935 (deficiency)	325,000.00	----------	----------
Fighting forest fires:			
1922	25,000.00	9,618.30	----------
1923	25,000.00	17,764.16	----------
1924	25,000.00	6,526.02	----------
1925	20,000.00	20,000.00	----------
General expenses, National Park Service:			
1931	25,000.00	24,993.02	----------
1932	35,100.00	31,904.58	----------
1933	37,000.00	33,914.87	----------
1934	25,000.00	24,585.00	----------
1935	24,500.00	----------	----------
Emergency reconstruction: 1925	20,000.00	17,009.15	----------
Forest protection and fire prevention:			
1931	96,850.00	95,856.95	----------
1932	170,000.00	[3] 167,247.75	----------
1933	140,000.00	132,491.82	----------
1934	147,000.00	108,580.00	----------
1935	69,600.00	----------	----------

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* [1]—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Emergency reconstruction and fighting forest fires:			
1926	$40,000.00	$80,000.00	
1926 (deficiency)	40,000.00		
1927	40,000.00	40,000.00	
1927 (deficiency)	235,000.00	228,647.83	
1928	40,000.00	26,865.46	
1929 (deficiency)	29,000.00	[4] 40,138.26	
1930	20,000.00	180,300.17	
1930 (deficiency)	180,000.00		
1931	50,000.00	40,481.49	
1932	50,000.00	[4] 169,950.35	
1932 (deficiency)	55,000.00		
1933	50,000.00	[4] 57,228.83	
1934	50,000.00	35,407.00	
1934 (deficiency)	100,000.00		
1935 (deficiency)	25,000.00		
Construction of roads and trails:			
1925 (deficiency)	1,000,000.00	1,000,000.00	
1926	1,500,000.00	1,500,000.00	
1927	2,000,000.00	2,000,000.00	
1928	2,000,000.00	2,000,000.00	
1928 (deficiency)	1,000,000.00	1,000,000.00	
1929	2,500,000.00	2,500,000.00	
1930	5,000,000.00	5,000,000.00	
1931	5,000,000.00	7,500,000.00	
1931 (deficiency)	2,500,000.00		
1932	5,000,000.00	5,000,000.00	
1933	4,500,000.00	4,500,000.00	
1934	2,435,700.00	1,477,200.00	
Emergency construction, roads and trails:			
1931 (deficiency)	2,078,800.00	2,078,800.00	
1933	3,000,000.00	3,000,000.00	
1935 (deficiency)	5,000,000.00		
Insect control:			
1925–26 (deficiency)	25,000.00	24,945.24	
1927	20,000.00	19,828.96	
1928	7,500.00	7,379.35	
Southern Appalachian:			
1925–26 (deficiency)	20,000.00	12,453.27	
1927	(4)	7,252.21	
1928	5,000.00	[4] 3,887.13	
1929	4.500.00	[4] 3,945.07	
1930	3,000.00	[4] 3,415 75	
1931	3,000.00	[4] 4,172.45	
Purchase of lands:			
1928	50,000.00	13,925.00	
1929	50,000.00	1,383.00	
1930	250,000.00	17,233.93	
1931	1,750,000.00	[5] 1,983,718.06	
1932	1,000,000.00	[4] 711,688.33	
1933		[5] 238,396.19	
Extension of winter-feed facilities:			
1930	75,000.00	7,612.50	
1931	75,000.00	10,265.00	
1932		[5] 12,022.50	
1933		[5] 477.50	
Purchase of lands Colonial National Monument:			
1931–32 (deficiency)	500,000.00	500,000.00	
Public-works projects, roads and trails:			
1933–35	26,884,144.00	4,103,107.00	
Public-works projects, physical improvements:			
1933–35	7,232,456.00	1,651,423.00	
Emergency conservation work:			
1933–35 (allotments program)	16,794,971.00	11,799,459.00	
Civil works, 1933–35	2,490,678.00	2,490,678.00	

[1] For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354–358, and for 1918–27 see 1930 Annual Report, pp. 66–72.
[2] Appropriation decreased by transfers to emergency reconstruction and fighting forest fires under authority contained in the appropriation act. (See table 18.)
[3] Appropriation augmented by transfers from other appropriations under 10-percent clause.
[4] Reappropriated items. (See table 14.)
[5] Available until expended.
[6] Funds lapsed. Park not established in specified time.
[7] Credited to the miscellaneous receipts in the District of Columbia.

NATIONAL PARKS TABLE 5.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reappropriated for fiscal year	Park	Amount	Purpose
1928	1929	Yosemite	$35,000.00	Hospital building.
1928	1929	Southern Appalachian	1,112.87	To remain available; general.
1928	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929	1930	Yosemite	8,661.78	Construction of water-supply and campground facilities.
1929	1930	Carlsbad Caverns	4,950.00	Superintendent's residence.
1929	1930	Southern Appalachian	1,662.55	To remain available; general.
1929	1931	Grand Canyon	20,000.00	Hospital building.
1930	1931	Acadia	2,850.00	Equipment storage building.
1930	1931	Crater Lake	1,091.06	Ranger station.
1930	1931	Mesa Verde	1,652.18	2 ranger stations.
1930	1931	Yosemite	32,662.70	Physical improvements.
1930	1931	National monuments	2,500.00	Employees' quarters (2) at Petrified Forest.
1930	1931	Southern Appalachian	1,246.80	To remain available; general.
1930	1931	Glacier	9,550.00	One-third of cost of constructing a telephone line.
1931	1932	National monuments	1,759.23	Water-supply system at Craters of the Moon.
1931	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931	1933	National monuments	3,204.50	Water supply at Chaco Canyon.
1932	1933	Carlsbad Caverns	13,000.00	Electric system, extension and improvement.
1932	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.
1933	1934	Emergency reconstruction and fighting forest fires.	9,143.93	To remain available; general.

NATIONAL PARKS TABLE 6.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917* [1] *to 1934, inclusive*

Year	Department	Appropriation		Revenues
1917	Interior Department	$537,366.67		
	War Department	247,200.00		
			$784,566.67	$180,652.30
1918	Interior Department	530,680.00		
	War Department	217,500.00		
			748,180.00	[2] 217,330.55
1919	Interior Department	963,105.00		
	War Department	50,000.00		
		50,000.00		
			1,013,105.00	196,678.03
1920			907,070.76	316,877.96
1921			1,058,969.16	396,928.27
1922			1,433,220.00	432,964.89
1923			1,446,520.00	513,706.36
1924			1,892,601.00	663,886.32
1925			3,027,657.00	670,920.98
1926			3,258,409.00	826,454.17
1927			3,698,920.00	703,849.60
1928			4,889,685.00	808,255.81
1929			4,754,015.00	849,272.95
1930			7,813,817.18	1,015,740.56
1931			12,113,435.00	940,364.79
1932			12,831,250.00	820,654.19
1933			10,640,620.00	628,182.06
1933–35			53,402,249.00	----------
1934			10,983,089.00	731,331.80
1935			12,461,513.00	----------

[1] For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.
[2] The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 7.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686	1925	[1] $1,000,000		$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179	1926	1,500,000	[2] $1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491	1927	2,000,000	[2] 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966	1928	2,000,000	[2] 2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237	1929	2,500,000	[2] 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601	1930		[2] 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319	1931	5,500,000		
Act Dec. 20, 1930; emergency construction	1931	1,500,000	[2] 2,500,000	
Emergency construction funds transferred by the President	1931	578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115	1932	5,000,000	[2] 2,850,000	
Second Deficiency Act 1931; Mar. 4, 1931		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127	1933	4,500,000	[3] 2,500,000	7,150,000
Emergency construction and relief		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853	1934	2,435,700		64,300
Emergency construction	1935	5,000,000		5,000,000
Total appropriated		44,514,500		
Total program to date				44,514,500

[1] Of this amount $4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and $510 on May 29, 1928 (45 Stat. 933).

[2] Funds appropriated in next year.

[3] $64,300 of this amount was not appropriated in 1934.

National Parks Table 8.—*Forest-fire statistics, calendar year 1933*

Park	Classification of fires				Location of origin of fires				Area burned inside parks (to nearest whole acre)				Timber destroyed inside parks			Costs of fire suppression (to nearest whole dollar)							
	A	B	C	Total	Inside parks		Outside parks																
	¼ acre or less	Between ¼ and 10 acres	10 acres or over	All classes A, B, and C	On Government lands	On private lands	Enter park	Confined to outside areas	Timber	Brush	Grass	Total	Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees	Grand total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Acres*	*Acres*	*Acres*	*Acres*	*M.b.f.*	*M.b.f.*	*M.b.f.*							
Acadia				0								0			0							
Bryce Canyon				0								0			0							
Carlsbad Caverns				0								0			0							
Crater Lake	7	1		8	7			1	1			1			0				$20	$20	$15	$35
General Grant				0								0			0							
Glacier	32	3	2	37	29		7	1	31			31	4		4	$2,720	$8,347	$1,570	1,670	14,315	228	[1] 14,543
Grand Canyon	8	3	1	12	12				21			21	19		19	34	61		16	111	44	155
Grand Teton				0								0			0							
Great Smoky Mountains	5	14	19	38	11	9	6	12	2,583		5	2,588		4	4	265	23			288	168	456
Hawaii	2			2			1	1				0			0							
Hot Springs	4	3	1	8	8				26			26			0	35				35		35
Lassen Volcanic	9	2		11	10			1				0			0						65	65
Mesa Verde		1	1	2	1		1		1	24		25			0	4	11			15		15
Mount McKinley				0								0			0							
Mount Rainier	9			9	9							0			0							
Platt	2	3	2	7	6		1				34	34			0						21	21
Rocky Mountain	6	2		8	4	1		3				0			0		1		3	4	23	27
Sequoia	35	4	5	44	37			7	4			4	24		24	206	9			215	255	470
Wind Cave			1	1	1				6		10	16			0	5				5	5	10
Yellowstone	24	9	6	39	38		1		1,979	151	57	2,187	2,493		2,493	3,129	1,620	676	1,308	6,733	1,056	7,789
Yosemite	27	7	3	37	56	1			120	40		160	27		27	10	14	45	36	105	171	276
Zion	1			1	1							0			0	2	2			4		4
Colonial Monument		6	1	7	4	1		2	1	4	10	15	.5	.5	1			5	16	21	34	55
Devils Tower	1			1	1							0			0	3				3		3
Muir Woods		1		1				1	4			4			0							
Bandelier	4			4	4							0			0							
Totals	176	59	42	277	219	12	17	29	4,777	219	116	5,112	2,567.5	4.5	2,572	6,413	10,088	2,296	3,077	21,874	2,085	23,959

[1] Glacier—Additional Emergency Protection Service amounted to $151; expense of $14,543 incurred largely in suppression of 2,400-acre fire immediately outside the boundary of the park.

M.b.f.=Thousand board feet. Figures on timber destroyed are estimates and not actual cruises.

NATIONAL PARKS TABLE 8.—*Forest-fire statistics, calendar year 1933*—Continued

Park	Causes of fires										Classification of fires according to cost of suppression (includes only those fires which burned inside park boundaries)									
	Lightning	Camp fires	Smokers	Debris burning	Incendiary	Lumbering	Railroads	Miscellaneous	Total man-caused	Grand total	$25 and under	$26 to $50	$51 to $100	$101 to $200	$201 to $500	$501 to $1,000	$1,001 to $2,000	$2,001 to $5,000	Over $5,000	Total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Acadia										0										0
Bryce Canyon										0										0
Carlsbad Caverns										0										0
Crater Lake	3		4					1	5	8	7									7
General Grant										0										0
Glacier	21	3	5	7				1	16	37	30		2	1	1	2				36
Grand Canyon	10		1	1					2	12	11		1							12
Grand Teton										0										0
Great Smoky Mountains			4	3	28		1	2	38	38	19	2	1	3	1					26
Hawaii								2	2	2	1									1
Hot Springs			7	1					8	8	8									8
Lassen Volcanic	7	1	2	1					4	11	8	2								10
Mesa Verde		1		1					2	2	2									2
Mount McKinley										0										0
Mount Rainier		9							9	9	9									9
Platt			7						7	7	6	1								7
Rocky Mountain	1	3	2					2	7	8	5									5
Sequoia	22	4	12	1	2	1	2		22	44	36	1								37
Wind Cave	1									1	1									1
Yellowstone	20	2	11	5				1	19	39	23	5	4		3	1		3		39
Yosemite	10	3	16	3				5	27	37	34		3							37
Zion					1				1	1	1									1
Colonial Monument	1		6						6	7	5									5
Devils Tower			1						1	1	1									1
Muir Woods				1					1	1										0
Bandelier	2	2							2	4	4									4
Total	98	28	78	24	31	1	3	14	179	277	211	11	11	4	5	3	0	3	0	248

NATIONAL PARKS TABLE 9.—*Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, April 1911 to June 30, 1934*

Item	Unit	Total work accomplished from start of program to June 30, 1934		
		National parks and monuments	State parks	Combined total national parks and State parks
NEW CONSTRUCTION				
Telephone lines	Miles	293	406	699
Firebreaks	do	198	632	830
Reduction of fire hazards	Acres	32,552	37,936	70,488
Roadside clearing or clean-up, fire prevention	Miles	1,170	592	1,762
Trailside clearing or clean-up, fire prevention	do	317	603	920
Lookout:				
Houses	Number	None	30	30
Towers	do	5	38	43
Fighting forest fires	Man-days	22,521	28,568	51,089
Fire:				
Presuppression	do	7,518	None	7,518
Prevention	do	1,122	None	1,122
General clean-up other than fire prevention	Acres	14,186	21,153	35,339
Forest stand improvement	do	3,615	28,991	32,606
Truck trails	Miles	687	670	1,357
Minor roads	do	12	236	248
Horse trails	do	337	405	742
Foot trails	do	146	827	973
Dwellings at—				
Permanent stations	Number	74	None	74
Temporary or seasonal stations	do	45	None	45
Tool houses and boxes	do	182	806	988
Barns	do	53	None	53
Office buildings	do	31	None	31
Public camp ground:				
Clearing	Acres	2,539	5,704	8,243
Buildings	Number	10	652	662
Latrines	do	73	497	570
Water systems	Feet	34,761	87,025	121,786
Waste disposal	do	2,025	21,813	23,838
Other public camp ground facilities	Number	1,376	3,909	5,285
Other structures	do	236	1,078	1,314
Fences:				
Other than range	Miles	45	236	281
Range	do	64	None	64
Water systems:				
(*a*) Storage facilities	Thousand gallons	31	11,973	12,004
(*b*) Pipe lines	Feet	36,969	297,225	334,194
(*c*) Wells and water holes	Number	19	461	480
Spring or well development for livestock	do	4	None	4
Reservoirs, water for livestock	do	9	None	9
Planting, forestation	Acres	1,537	13,160	14,697
Nursery	Man-days	6,019	16,691	22,710
Experimental plots	Number	7	None	7
Range revegetation	Acres	174	None	174
Seed collection:				
(*a*) Conifers (cones)	Bushels	31	203	234
(*b*) Hardwoods and other	Pounds	1,569	4,750	6,319
Insect pest control:				
(*a*) Tree	Acres	171,412	85,511	256,923
(*b*) Other	do	3,673	11,671	15,344
Rodent control	do	None	8,529	8,529
Tree- and plant-disease control	do	22,169	25,522	47,691
Eradication of poisonous and other plants	do	984	4,849	5,833
Surveys:				
(*a*) Linear	Miles	13,470	2,502	15,972
(*b*) Topographic	Acres	18,846	59,634	78,480
(*c*) Timber estimating, forest type, range, special use, etc	do	549,834	None	549,834
(*d*) Model or relief maps	Square feet	75	None	75
Erosion control:				
(*a*) Dams	Number	1,381	None	1,381
(*b*) Land benefited	Acres	50,683	22.417	73,100
(*c*) Bank protection	Square yards	301,540	869,150	1,170,690

NATIONAL PARKS TABLE 9.—*Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, April 1911 to June 30, 1934*—Continued

Item	Unit	Total work accomplished from start of program to June 30, 1934		
		National parks and monuments	State parks	Combined total national parks and State parks
NEW CONSTRUCTION—continued				
Footbridges	Number	73	536	609
Horse bridges	do	63	87	150
Vehicle bridges	do	173	331	504
Stock bridges, also cattle guards and gates	do	2	None	2
Water improvement:				
(a) Lake, pond, or beach	Acres	14	12,104	12,118
(b) Stream	Miles	58	249	307
(c) Restocking fish	Number	373,000	None	373,000
Ponds for fish and birds	do	90	None	90
Dams, recreational	do	3	810	813
Corrals	do	13	None	13
Flood control:				
(a) Line and grade (surveys)	Linear feet	170,303	None	170,303
(d) River bank (clearing)	Square yards	5,000	18,042,119	18,047,119
(e) Channel (clearing)	Linear yards	29,660	88,677	118,337
(u) Cribbing, includes riprap filling	Linear feet	3,580	None	3,580
Clearing, dam site	Square yards	None	74,051	74,051
Landscaping:				
(a) Unclassified	Acres	5,489	11,178	16,667
(b) Fine grading (road slopes, parking areas, etc.).	Cubic yards	146,274	None	146,274
(c) Soil preparation	Square yards	222,580	None	222,580
(d) Seeding or sodding	Acres	227	None	227
(e) Moving and planting trees or shrubs	Number	162,272	None	162,272
(f) Tree surgery	Man-days	3,126	None	3,126
Masonry guard rails	Cubic yards	486	376	862

GEOLOGICAL SURVEY

WALTER CURRAN MENDENHALL, Director

From the point of view of the geologists of this continent, the important event of the year was the meeting in Washington, in July, of the sixteenth session of the International Geological Congress. The only other session held in the United States was the fifth, in 1891.

The technical sessions were held during the week July 22–29. They were preceded and followed by excursions to points of geologic interest east and west, two of them crossing the continent to the Pacific and back. One hundred interesting and valuable papers dealing with the geology and mineral resources of various parts of the world were presented and discussed. Nine of these papers were presented by members of the Survey staff. Leading geologists from all the principal nations were present and participated, 34 foreign countries being represented by official delegates. The total enrollment included 1,181 scientists and scientific institutions, about one-third of them from abroad. The various geologic institutions and individual geologists of the United States shared in the duties of host, served as officers of the Congress here and as guides on the geologic excursions, and participated in the preparation of the guidebooks for these excursions. In all these activities the staff of the Survey participated. Two principal publications arising out of the activities of the Congress are in course of publication—the report containing the proceedings of the Congress and a volume on the "Copper resources of the world."

The Geological Survey hastened the issue of its new geologic map of the United States, which had been in preparation for a number of years, so that it appeared in time for the meeting.

The year has been one of adaptation to altered conditions of government. The new agencies and services have made many and varied demands upon the facilities and the staffs of the Survey. Its specialists and their specialized knowledge in problems of water supply, mapping, geology, engineering, and land classification have been in embarrassing demand. Difficult adjustments were necessary at the beginning of the year. Economy legislation had reduced regular appropriations to a point where many separations from the service were necessary and many important projects had to be suspended. Later the Public Works Administration allocated funds which completely absorbed the available engineers of the Survey staffs and per-

mitted the employment of many hundreds of unemployed technical men in undertaking or advancing important projects, such as topographic mapping, the suppression of mine fires, the plugging of abandoned oil wells on the public domain, and a survey of some of the more important mineral resources of the Eastern and Southern States. The Survey is thus enabled to continue to apply its specialized technical services in valuable ways during the emergency. Its activities for the time being are somewhat out of normal balance, the greatest present loss, which it is hoped is temporary, being in facilities and funds for publication. A summary of the activities of the year follows.

The appropriations made directly for the work of the Geological Survey for the fiscal year 1934 included 11 items, amounting to $1,992,500. Principally because of economy measures by the administration, which restricted the use of these funds, the balances of these appropriations unexpended as of June 30, 1934, totaled $346,287.23, of which $248,000 was continued available for expenditure during the fiscal year 1935. In addition, $9,345.80 was allotted from appropriations for the Interior Department for miscellaneous supplies.

A detailed financial statement is given at the end of the report.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—The geologic field work done during the year included a continuation of surveys of phosphate and oil shale in Wyoming, oil in California, coal in New Mexico, and metal-mining districts in Colorado, Idaho, and New Mexico, also work under allotments from the Public Works Administration in 19 States east of the Rocky Mountains, on projects involving mineral-resources and land-classification surveys. The work in the metal-mining districts was aided by cooperative funds provided by the States, and continuation of the volcanologic work in Hawaii was made possible by contributions from the Hawaiian Research Association. A survey of the mineral resources of the Boulder Dam region in Nevada, Arizona, and California was made for the Bureau of Reclamation, and reservoir dam sites in several Western States were examined for the Bureau of Reclamation and the Indian Service. During the year 4,259 examinations were made by the section of chemistry and physics, including 1,109 tests or identifications of specimens for persons not officially connected with the Survey.

Explorations in Alaska.—In the field season of 1933 4 field projects in Alaska were undertaken, 2 of which were primarily topographic and 2 primarily geologic. One of the topographic projects was carried on in cooperation with the Navy Department, and one of the geologic projects in cooperation with the Alaska Railroad. The usual general survey of recent mining developments and the collection of mineral statistics were continued. Seven field projects for the season of 1934 had been started at the end of the fiscal year and will be continued throughout the open season. One of these projects is carried on in cooperation with the Alaska Railroad. In addition to these field projects, work was continued throughout the year in the preparation of base maps from the aerial photographs taken in 1926 and 1929 by the Navy Department. For part of the time this cooperative work was carried on in the Washington office, but for the greater part of the year it was done in Juneau, Alaska, with an enlarged staff.

Topographic mapping.—The area mapped topographically during the year amounted to 21,534 square miles, and the total area now mapped exclusive of Alaska is 1,394,266 square miles. Ten States, the District of Columbia, and Hawaii are completely mapped, and the percentages in the other States range from 9.4 in Florida to 88.9 in Virginia. Of the continental United States exclusive of Alaska, 46.1 percent has been mapped. Cooperative funds furnished by the States for topographic mapping during the year amounted to $181,692.24 and came from 12 States and 1 county. Cooperative aid was also extended to the Division of Subsistence Homesteads.

At the request of the Bureau of Public Roads, through the use of transferred funds, the preparation of a transportation map of the United States was begun. The plan provides for a series of 439 rectangular sheets on a uniform scale of 1:250,000, covering the entire country but to be issued in State units. The maps will show the routes of travel and transportation by land, water, and air.

Aerial photographs were furnished by the Air Corps, United States Army, covering 7,961 square miles, and by commercial firms covering 23,522 square miles, for use in the compilation of topographic base maps, both with and without contours.

Investigation of water resources.—The work on water resources is done largely in cooperation with Federal bureaus, with State, county, municipal, and other governmental agencies, and with permittees and licensees of the Federal Power Commission. The funds made available by States and municipalities for cooperative work during the year amounted to $467,226.35. In addition, data valued at over $145,000 were furnished by cooperating officials. Investigations of surface water were carried on in the 48 States, the District of Columbia, and Hawaii, and 2,941 regular gaging stations were being maintained at the end of the year. In this work 41 States and Hawaii cooperated. About 65 investigations relating to ground water were in progress during the year in 28 States and Hawaii. In the hydrologic laboratory 383 samples of water-bearing material were analyzed. The work on quality of water involved the analysis of 1,226 samples from surface and underground sources. The investigations of power resources included the preparation of monthly and annual reports on the production of electricity for public use and the fuel consumed in generating it, a report on the developed water power of the United States, and a report on the capacity of water wheels in water-power plants in the United States. Investigations of problems affecting the utilization and control of the waters of streams were continued.

Classifying and leasing public land.—The classification of public and quasi-public lands with respect to mineral, water-power, and agricultural value and the technical supervision of mineral and power development on such lands were continued in 22 States and Alaska. The number of cases involving land classification acted on during the year was 10,464, and the results accomplished include the classification of 482,840 acres as coal land, 593,834 acres as noncoal land, with a net reduction of 936,433 acres in outstanding coal withdrawals. At the end of the year the total area classified as mineral in character was 37,487,759 acres in 14 States and Alaska, and the outstanding mineral withdrawals amounted to 49,985,402 acres in 14 States. Definitions of "known geologic structure" covered 15,395 acres in 3 States, and at the end of the year the areas so defined amounted to 960,346 acres in 7 States. Investigations to obtain basic information as to the water-power resources of public lands covered about 1,400 linear miles of streams in 11 States and included studies of foundation material and conditions at 6 dam sites in 3 States. There was a net increase of 117,561 acres in the existing power reserves, making a total of 6,800,371 acres in 22 States. The areas designated as subject to the stock-raising homestead act had a net reduction to 119,339,332 acres in 20 States, and the area designated as subject

to the enlarged-homestead act had a net reduction to 294,413,685 acres in 14 States. There was a net increase in public water reserves, to 494,728 acres in 13 States. Federal properties subject to the mineral-leasing laws under supervision at the end of the year numbered 7,122 in 19 States and Alaska and involved a total of 9,541,487 acres. Leases, licenses, and prospecting permits were issued for 1,247 properties and terminated for 368 properties. The mineral production from lands under leases, licenses, and permits amounted to 25,055,175 barrels of petroleum, 57,866,857 cubic feet of natural gas, 87,728,595 gallons of gas gasoline, 2,688,687 tons of coal, 289,837 tons of potassium, 45,830 tons of sodium, and 43,067 tons of phosphate. The revenue accrued from these operations in the form of royalty, rent, or bonus amounted to $3,991,571. Technical supervision of mineral development on Indian lands and of operations for the production of oil and gas in naval petroleum reserves was continued. The work undertaken with funds allotted by the Public Works Administration covered 49 projects in nearly all the public-land States. The allotments for these projects amounted to $889,964. Most of the projects were planned for continuance during a period of 18 months and were not completed at the end of the year.

Publications.—The publications of the year consisted of 47 books and pamphlets in the regular series, covering 6,602 pages, 91 new or revised maps, and 157 reprinted maps. In addition to these publications, 46 brief papers in mimeographed form were issued as memoranda for the press. The publications distributed numbered 774,927, of which 1,358 folios and 457,965 maps were sold for $36,723.30.

GEOLOGIC BRANCH

SUMMARY

At the beginning of the fiscal year the geologic branch faced a reduction of 37½ percent from the inadequate funds available for the preceding year. Field work was still further curtailed, though four small parties already in the field, surveying phosphate and oil shale lands in Wyoming, oil in the San Pedro Hills of California, and coal in northwestern New Mexico, were continued in field service for varying brief periods. With the aid of cooperative funds contributed by the States, work was also continued in the metal-mining districts of Colorado, Idaho, and New Mexico.

Geologists unable to undertake field investigations devoted their energies largely to completion of reports on field surveys of previous years. Office work was reduced, however, by the extended administrative furloughs that were necessary for members of the branch's professional staff. Volcanologic work in Hawaii could not have been continued without the help of the local voluntary Hawaiian Research Association, which contributed a large proportion of the salaries of the three employees and the expenses of the observatory on Kilauea.

Early in January 1934 the Public Works Administration allocated $276,000 for mineral-resource and land-classification surveys by the geologic branch in 19 States east of the Rocky Mountains, from New York and North Dakota on the north to Florida and Texas on the south. Work was begun on these projects almost immediately in the South and extended northward as climatic conditions per-

mitted. It will be continued on most of the projects through a considerable part of the next fiscal year. The progress of the work on each of them is summarized under the heading "Work of the year, by States." While giving employment to more than 150 unemployed geologists, engineers, technical assistants, and laborers, these projects have necessarily been under the direct supervision of trained members of the branch's regular staff.

Members of the geologic branch were also detailed to conduct a survey of the mineral resources of the Boulder Dam region in Nevada, Arizona, and California for the Bureau of Reclamation, and to assist in Public Works projects under the conservation branch in Oklahoma and under the water-resources branch in Georgia, New Jersey, Colorado, Utah, and Arizona. Geologists have also been assigned to the examination of reservoir dam sites for the Indian Service and the Bureau of Reclamation in several Western States.

WORK OF THE YEAR, BY STATES

Alabama.—Reports on the brown iron ores of the Russellville district and the iron ore of the Red Mountain formation, in northeastern Alabama, cooperative projects with the Geological Survey of Alabama, are in preparation. Projects in the State financed by the Public Works Administration were begun by parties supervised by members of the Geological Survey, with 26 temporary employees. Mapping of the Woodstock brown iron ore area was done under project 157. Project 161 provided for investigations in the Russellville district to determine the reserves of brown iron ore; a study of gold and tin resources, comprising a reconnaissance through the mineralized areas in northern Alabama, with mapping of the Hog Mountain and other gold-mining districts, and an examination of tin prospects resulting in a brief paper on "Tin deposits of Alabama"; explorations for bleaching and other high-grade clays; and a survey of bauxite deposits.

Arizona.—Reports are in preparation on the geology and ore deposits of the Ajo copper district, the geology of the Tucson quadrangle, and manganese deposits near Artillery Peak. The Boulder Dam investigation is noted under California.

Arkansas.—Under Public Works project 163, field studies were made of coal and gas resources of the Arkansas Valley in Sebastian County and adjacent areas in Crawford, Franklin, and Scott Counties; detailed topographic and geologic mapping of the southern Arkansas quicksilver district and investigations of supposed cinnabar occurrences outside the main district were carried on; and a preliminary reconnaissance to determine areas for prospecting for bauxite was conducted in Pulaski, Saline, and Hot Springs Counties. These surveys, which gave employment to 16 temporary assistants, were all still in progress at the end of the year. A paper on enargite and wulfenite in ore deposits of northern Arkansas was transmitted for outside publication, and a paper on the origin of lead and zinc deposits of northern Arkansas was prepared for presentation before the Geological Society of Washington. Other projects and reports are noted under Oklahoma.

California.—Work was continued on the general report on the Kettleman Hills oil and gas field, on a paper on faulted folds and the formation of arcs of the North Dome of this field, and on core and outcrop samples from the region, and an advance edition of a geologic and structure map of the area was issued.

Field work in connection with the study of source rocks of oil was continued in the vicinity of Los Angeles and other areas, and, aided by a grant from the Geological Society of America, samples were collected from many localities in the State in connection with the study of the calcium carbonate content of fine-grained clastic sediments. A paper on the source beds for petroleum in the Mesozoic rocks on the west side of the Sacramento Valley was completed for publication in the Bulletin of the American Association of Petroleum Geologists, and work was continued on a report on salinity compared with temperature as a factor affecting the calcium carbonate content of sediments. Field work in the San Pedro Hills was completed, and office work was begun on the compilation of data for a report on the geology and mineral resources of the area. Studies of the lithium pegmatites of San Diego County were resumed. A survey of the Nevada City mining district was begun with aid from the Geological Society of America. Continued field and office work was done in connection with the preparation of reports on the San Andreas Rift and Cajon Pass and the southern portion of the Death Valley region, and progress was made on reports on the geomorphology of the upper San Joaquin Basin, on the Monterey siliceous rocks, on the Grass Valley mining district, and on chromite deposits in northern California.

By the aid of a transfer of $10,000 from a fund of $25,000 allotted by the Public Works Administration to the Bureau of Reclamation for a resource and industrial survey of the Boulder Dam region, 6 geologists of the Geological Survey devoted from 6 weeks to 4 months each to the field study of the mineral resources that lie in Arizona, California, Nevada, and Utah within 200 miles of the Boulder Dam. A reconnaissance survey was made of the principal ferrous and nonferrous metal deposits and most of the nonmetallic mineral deposits of the area, and a somewhat more detailed study was made of the magnesite resources of the Muddy Mountains, Nevada. A preliminary report on this survey is about ready for transmission, and the final report will be completed soon. Drafting work toward the completion of the geologic map of California was carried on under Public Works project 153, and a new building for the volcanologic station at Mineral was completed under project 151.

Colorado.—Investigations of the mining regions of the State have been carried on for several years in cooperation with the Geological Survey Board of Colorado and the Colorado Metal Mining Fund. Field work was continued in the Ouray, Red Mountain, and Sneffels districts of the San Juan region and in the Nederland tungsten district of Boulder County and other parts of the Front Range and was completed in the Jamestown district, Boulder County, and in the Snowmass district, Pitkin County. The smaller mining districts of Chalk Creek, Granite, Frisco, and Tenmile were examined, and stratigraphic studies of several sections were made. A press memorandum on the Red Arrow gold discovery, in the La Plata Mountains of Montezuma County, was issued; the report on Paleozoic stratigraphy was nearly completed; some progress was made on a general report on the geology and ore deposits of the State and on a report on the Cripple Creek district. Two papers resulting from these investigations were published by the Colorado Scientific Society—"Vein system of Arrastre Basin and regional geologic structure of the Silverton and Telluride quadrangles" and "A recent rock slide near Durango, in La Plata County"—and several other papers were submitted for publication through unofficial mediums.

At the request of the Public Works Administration, examinations were made in the Cripple Creek district with special reference to a proposed deep drainage tunnel and at the town of Englewood with reference to the adequacy of the artesian water supply. An examination of the Douglas Creek diversion tunnel was made for the State engineers.

Florida.—Areas of reserved public lands in Marion and Polk Counties are being prospected for phosphates under Public Works project 164, by a party in which 10 temporary assistants are employed. Reports were in progress on the Tampa limestone, on Choctawhatchee gastropods from the Allaqua Creek Valley, and on Pelecypoda of the Alum Bluff formation. Reports on a new species of *Pecten* from the Oligocene near Duncan Church, Washington County, and on the pelecypod genus *Vulsella* in the Ocala limestone of Florida and its bearing on correlation were submitted for publication in a scientific journal.

Georgia.—Work on the gold and associated economic minerals of Georgia, by parties working under Public Works projects 158 and 165, consisted of detailed mapping in the Dahlonega district of Lumpkin County, examination of mines of McDuffie County, a reconnaissance of all the active gold properties and most of the old mines of the State in the gold belt, and a reconnaissance of kyanite and vermiculite in northern Georgia. Field reports and maps have been prepared.

Idaho.—Cooperation with the Idaho Bureau of Mines was continued in the mining districts of the Boise Basin, Thunder Mountain, Yellow Pine, and the western part of the Nez Perce National Forest. Work was continued in the office on the compilation of data for a report on the geology and ore deposits of the Bayhorse region, Custer County; a general report on southeastern Idaho; and a report on the Idaho mining districts (a revision of the Idaho portion of Bulletin 507). Reports by geologists of this Survey on the Dome mining district, Butte County, and on gold-bearing gravel of the Nez Perce National Forest were published as Pamphlets 39 and 40, respectively, of the Idaho Bureau of Mines. Preparation of a report on the geology and mineral resources of the Paradise Valley and Ammon quadrangles was continued.

Papers on recent block faulting in Idaho, on contact phenomena associated with the Cassia batholith, on the composition of a part of the Idaho batholith, Boise County, on silver mineralization in the Banner district, Boise County, and on the correlation and interpretation of Paleozoic stratigraphy in south-central Idaho and an abstract of a paper on stratigraphic correlation by heavy minerals in Paleozoic beds in Idaho were transmitted for outside publication.

Illinois.—Work on the Pottsville flora of the Eastern Interior Basin was continued in cooperation with the Illinois Geological Survey. Under Public Works project 166 an investigation of the fluorspar reserves in southern Illinois was begun by a party of four temporary assistants under the supervision of a geologist of the United States Geological Survey.

Indiana.—Office work was continued on a report on new crinoid genera from the Mississippian, Devonian, and Silurian.

Iowa.—Work was continued on a paper on the typical Kinderhook fauna.

Kansas.—Under Public Works project 167 a survey of the coal resources of Cherokee, Osage, Labette, and Crawford Counties was begun by a party which included three temporary junior geologists, and geologic mapping and examination of mines were carried on in southeastern Kansas as part of a study of lead and zinc in the tri-State district (Oklahoma, Kansas, and Missouri).

Kentucky.—Public Works project 168 provided for detailed mapping of the coal field in Pike County, in which 8 temporary junior geologists were employed, and for a survey of the deposits of bleaching and other high-grade clays of western Kentucky by a temporary junior geologist, with 2 rodmen, under supervision of Survey geologists. Work is still in progress.

Maryland.—A study of the sand and gravel resources of the area tributary to Washington and Baltimore is being made under Public Works project 169 by a geologist with one assistant and has covered areas in Prince Georges and Montgomery Counties.

Massachusetts.—Work on the geology of the Taconic quadrangle was continued.

Michigan.—See Minnesota.

Minnesota.—A report on the pre-Cambrian rocks of the Lake Superior iron-ore region is in process of publication by the Survey as Professional Paper 184.

Mississippi.—Public Works project 171 provided for an investigation of the bleaching and other high-grade clays of Mississippi, and reconnaissance examinations in several countries of south and central Mississippi, with detailed examination of some more promising deposits in Smith County, were made by 2 geologists and 3 assistants. A brief examination of bauxite in the vicinity of Ripley, Pontotoc, New Albany, and Oxford was made. A paper on the volcanic and structural history of the Jackson anticline is in preparation.

Missouri.—In connection with investigations under Public Works project 172 for a study of the tri-State lead and zinc area, stratigraphic studies, mapping of underground structure, and examination of the principal mines were made by a party of three temporary employees working under the supervision of a Survey geologist, in the Joplin, Waco, Jet, and Carthage districts, Jasper County, and the Diamond district, Newton County. This project also provided for investigation of the manganese deposits of southeastern Missouri, the field work for which was completed.

Some progress was made on reports in preparation on the Pleistocene diversion of the Mississippi River across Crowleys Ridge, in southeastern Missouri, on the Warsaw fauna of the Boone limestone from the Joplin district, and on the fauna of the Louisiana limestone of northeastern Missouri.

Montana.—Reports on the lignite field of McCone County and on the Mizpah coal field of Custer County were completed for Survey publication, and reports on the geomorphology and glacial geology of western Montana, fossil plants from the Fort Union and associated formations, the geology and mineral resources of parts of Liberty Hill and Chouteau Counties, the Pioneer gold district, and the phosphate near Maxville, Philipsburg, and Avon, Granite County, were in preparation. A report on the geology and ore occurrences in the Flathead mine and vicinity, Flathead County, was transmitted to the Montana Bureau of Mines for publication. Mapping of the geology and ore deposits of the Libby quadrangle was continued. A report on gold quartz veins south of Libby was issued as Circular 7.

Nevada.—Reports are in progress on the Tonopah, Tuscarora, Gold Range, Searchlight, and Delamar mining districts. A report on the Contact district was completed and transmitted for publication, and a number of papers prepared as byproducts of the official reports were submitted to scientific and technical journals.

New Mexico.—Field studies on the east side of the San Juan Basin, in Rio Arriba County, were continued with special reference to the coal and oil possibilities of the region. The report on the La Ventana-Chacra Mesa coal field, lying partly in McKinley, Sandoval, and San Juan Counties, was completed for publication as part 3 of the bulletin on the geology and fuel resources of the southern part of the San Juan Basin, and work was continued toward the preparation of a detailed report on the Mount Taylor coal field. Studies have been carried on in cooperation with the New Mexico Bureau of Mines and Mineral Resources in the Central mining district and the Virginia mining district of the Lordsburg area, and a report on the Bayard area of the Central mining district was completed. A report on the geology and ore deposits of the Magdalena district is in preparation. Economic and petrographic studies of cores from Government potash tests were made.

New York.—A survey of the gas resources of south-central New York under Public Works project 173 was in progress in Allegany, Cattaraugus, Chemung, and Steuben Counties, by 2 geologists, with 7 temporary assistants.

North Carolina.—The gold-bearing regions of North Carolina, including the principal gold-placer areas, were examined by several parties directed by Survey geologists under an allotment from the Public Works Administration (projects 158 and 174). One party consisting of a temporary geologist with assistance of a rodman completed geologic mapping and examination of mines and mining localities in the slate belt extending from Anson County to Davidson County; and another party made a reconnaissance of the gold-bearing regions of the western part of the State, with detailed studies of the mines and prospects in Gaston and Mecklenburg Counties. Reports on these investigations were well advanced.

North Dakota.—The Public Works Administration under project 159 provided for an investigation of the coal resources of the Minot district, and work was begun in May and continued to the end of the fiscal year by a Survey geologist and two temporary assistants. Mapping of the Minot and Sawyer quadrangles and the northern part of the Benedict quadrangle was accomplished.

Oklahoma.—A study of the lead and zinc of the tri-State district (Oklahoma, Missouri, and Kansas) was financed by the Public Works Administration, the work in Oklahoma being a part of project 175. Before detailed work was begun a preliminary reconnaissance of the district was made by two Survey geologists. For several months a Survey geologist with four field assistants has been engaged upon a study of the structural features of certain typical mines of the region, including those near Picher, with a general stratigraphic examination of the area. Project 175 also provided for a study of the coal and gas in the Henrietta-Eufaula-Stone Bluff area of eastern Oklahoma. A party under the direction of 2 Survey geologists employing 2 junior geologists and 3 field assistants mapped an area in northern Pittsburg, western Haskell, and western Latimer Counties.

Office work on reports on the following subjects was continued: The Howe-Wilburton coal district of southeastern Oklahoma, the Pennsylvanian flora of the coal fields of eastern Oklahoma, the Moorefield fauna, the fauna of the Sycamore limestone, and the Radiolaria from Arkansas novaculite and from the Big-fork chert of Oklahoma and Arkansas; and the report on the geology and coal resources of the McAlester district, Pittsburg, Atoka, and Latimer Counties, was completed for official publication. Papers on the correlation of the Pennsylvanian strata in the Arkansas and Oklahoma coal fields, the Carboniferous rocks of the Ouachita Mountains, the relation of the Ouachita belt of Paleozoic rocks to the oil and gas fields of the Midcontinent region, and the age of the Jackfork and Stanley formations of the Ouachita geosyncline as indicated by plants were submitted for publication by the American Association of Petroleum Geologists.

Oregon.—Reports on the geology and mineral resources of the Baker quadrangle and on nonmetallic mineral resources of eastern Oregon have been submitted for publication. Circular 8, on the beach placers of the Oregon coast; Bulletin 846–A, on some mining districts of eastern Oregon; and Bulletin 846–B, on the geology and ore deposits of the Takilma-Waldo district, including the Blue Creek district, were issued.

Pennsylvania.—The report on the geology and mineral resources of the Butler and Zelienople quadrangles was completed, and work was continued on reports on the geology and mineral resources of the Reading, Boyertown, Hanover, York, Honeybrook, and Phoenixville quadrangles and on the lower Kittanning coal bed of western Pennsylvania.

South Carolina.—The report on the geology of the Coastal Plain of South Carolina was completed. Under Public Works projects 158 and 176, a reconnaissance of the gold belt of the State was made, and later a survey of the gold-

bearing rocks and associated economic minerals was carried on in York and Cherokee Counties by a temporary junior geologist and one assistant under the supervision of a geologist of the Survey.

Tennessee.—Under Public Works project 177, 2 geologists of the Survey with a temporary junior geologist and 5 field assistants made a reconnaissance of the zinc areas of eastern and northern Tennessee and did areal mapping in the Mascot-Jefferson City and White Pine districts, studied the Felknor and Grasselli zinc mines, made examinations in the Powell-Clinch River belt and the Sweetwater barite district, and visited the Coker Creek gold district.

In connection with a study of the high-grade clays of the State of possible economic importance, also provided for under project 177, examinations were made of the bleaching and ball clay deposits in Carroll, Hardeman, Henry, and Madison Counties, in western Tennessee, and of the fire clays in the eastern part of the State, particularly in Cumberland County.

Texas.—Public Works project 178 included allotments for a study of the Terlingua and Shafter mining districts, the bleaching clays of the San Antonio area, the brown iron ores of northeastern Texas, and the oil, gas, and coal resources of part of north-central Texas. The examinations in the Terlingua quicksilver district, Brewster County, and the Shafter silver district, Presidio County, have given employment to three additional men. A progress report on the Terlingua district was issued by the Texas Bureau of Economic Geology. A party composed of 2 geologists, 4 assistants, and 5 laborers is engaged in a survey of the brown iron ore area, which includes detailed studies in Cass, Marion, and Morris Counties and a reconnaissance of small deposits in Gregg, Harrison, Rusk, and Upshur Counties. The study of the clays of the San Antonio area, made by a Survey geologist with three assistants, included prospecting for fuller's earth and ceramic clays in Bexar and Medina Counties and examination of clay localities in Atascosa and Wilson Counties. Geologic mapping has been carried on in Young, Stephens, Coleman, and Brown Counties in connection with the study of the oil, gas, and coal resources of parts of north-central Texas and gave employment to seven temporary assistants.

The compilation of the cooperative State geologic map and the revision of the cooperative monograph of fossils from the Navarro formation of Texas progressed. Further field and office studies of Permian rocks in the Diablo Plateau region were made. Studies of core material from Government potash tests in Texas were completed.

Utah.—The report on the geology of the Monument Valley-Navajo Mountain region, San Juan County, was completed and transmitted for publication as a bulletin of the Survey. Manuscripts of reports on a geologic and geographic reconnaissance of southeastern Utah, on the geology and mineral resources of the Randolph quadrangle, and on the Book Cliffs coal field southeast of Sunnyside were nearing completion, and progress was made on the reports describing the geology of the Green River Desert and the eastern flank of the San Rafael Swell and on the stratigraphy and structure of the region between the Green and Colorado Rivers, Grand and San Juan Counties. A report on the geology and ore deposits of the Cottonwood-American Fork mining region has been revised by the authors.

Vermont.—Field and office work in continuation of a study of the geology of northwestern Vermont was carried on, and a paper on the Ordovician-Silurian relations in Vermont was in course of preparation.

Virginia.—A study of the zinc deposits of an area in the vicinity of Wytheville, in Wythe and Smyth Counties, which is an extension of the zinc-lead region under examination in eastern Tennessee, was conducted by a geologist with one assistant and was financed by Public Works project 158.

The titanium deposits of Nelson and Amherst Counties were investigated in connection with a report on the titanium minerals of Virginia in preparation. Lands in an area proposed as an addition to the Monongahela National Forest were examined by a Survey geologist, and a report submitted to the Forest Service.

West Virginia.—Study of the manganese ores of eastern West Virginia under Public Works project 179 was made by a Survey geologist and one assistant. The examinations extended over portions of Morgan, Berkeley, Mineral, Hampshire, Grant, Hardy, Pendleton, Pocahontas, Greenbrier, Monroe, Mercer, and Jefferson Counties. A report was made to the Forest Service in connection with the proposed addition to the Monongahela National Forest.

Wisconsin.—See Minnesota.

Wyoming.—Field study of the oil-shale deposits of the Fossil and Washakie Basins of southwestern Wyoming was continued, and office work on reports on the Tertiary rocks and the oil shale of the Green River Basin were in progress. Field mapping was also continued in a portion of the Afton quadrangle in connection with the detailed study of the geology and mineral resources of this area, and an examination was made of the Washakie dam site, on the Wind River, for the Office of Indian Affairs.

WORK IN CHEMISTRY AND PHYSICS

The work in chemistry and physics includes the chemical analysis of rocks, ores, and minerals collected by geologists, tests necessary to identify specimens received by the Survey, the development of new tests and methods of analysis required by the expanding use of natural resources and the rarer elements, descriptive mineralogy, including studies of the physical properties of rocks and minerals, and geophysical investigations covering such subjects as deep earth temperatures, the formation of sedimentary deposits, radioactivity, and geologic time.

Among the materials analyzed in the laboratory during the year were a rubidium-bearing biotite from South Dakota, a radioactive microlite from Colorado (the age of which can be computed from the analysis), magnesite from California, hydromagnesite from Nevada, native lead and bismuth from Alaska, over 30 igneous rocks, a great many clays, ores, phosphates, and several new minerals.

During the year 4,259 examinations were made by the section of chemistry and physics. In addition to 1,109 specimens tested or identified for persons not officially connected with the Survey, 951 chemical analyses were made for geologists or in aid of geologic projects, 778 analyses were made in connection with methods of analysis and with geochemical studies relating to the formation of ores and minerals and their alteration under natural conditions, and 1,421 identifications of minerals in potash cores, well cuttings, and similar samples were made by petrographic methods or other tests.

ALASKAN BRANCH

The Geological Survey work in Alaska is concerned primarily with the investigation of the mineral resources of the Territory and comprises field examination of the various factors that pertain to the character, distribution, and development of these resources and laboratory and office studies by which these field observations are analyzed and coordinated and the results made available to the public through reports, maps, and other media. In addition to the funds regularly appropriated by Congress for this work, Public Works Administration funds were granted to supplement those for a general project (Federal project 162) and to enable the Geological Survey to carry on certain special work (Federal project 69). Cooperation was also continued with the Alaska Railroad, and some work was done in cooperation with the Navy Department. Insufficient funds necessitated disbanding early in July 1933 the personnel that for several years had been attached to local Alaska field offices to maintain technical supervision over the oil and coal prospecting permits and leases granted by the Government. For the rest of the year this supervision was carried on by the personnel engaged in similar work in the States proper.

Manuscripts and publications.—During the year 16 reports and 2 maps have been published, and 3 maps were issued in preliminary photolithographic editions. In addition, 12 manuscript reports (including maps) and 1 separate manuscript map have been completed by their authors and are in various stages of critical review, proof, or preparation for publication. At the end of the year 6 manuscript reports and 4 manuscript maps were partly completed.

Work of the year.—In addition to the routine duties of handling all matters relating to the Geological Survey's part in the development of Alaskan mineral resources, 7 principal projects, 4 of which involved new field work, were carried on during the season of 1933. The field projects included 2 that were primarily geologic and 2 that were primarily topographic. The geologic projects were a reconnaissance of the principal mining camps in the Ruby-Kuskokwim region of central Alaska and reconnaissance investigations of the potential lode resources of the Willow Creek-Kashwitna district of the Cook Inlet-Susitna region—an area contiguous to the Alaska Railroad in central southern Alaska—in which the Geological Survey cooperated with the Alaska Railroad. The 2 topographic projects were the continuation of surveys in southeastern Alaska to extend the mapping northward from the Wrangell district to include areas adjacent to Sumner Strait, and a detailed survey of part of the chain of the Aleutian Islands in cooperation with an expedition sent by the Navy Department for special examinations. The 3 projects not directly involving new field work were the annual canvass for the collection of statistics regarding mineral output, as a basis for the Geological Survey's annual report on the progress of the mineral industry; the continuation of the compilation of a drainage map of southeastern Alaska from aerial photographs taken some years before by the Navy Department at the request of the Geological Survey; and the preparation of a comprehensive report

on a large area in the central part of the Copper River region, so as to coordinate and make current the various observations and investigations that had been in progess in this area for more than 30 years. Although listed above as one of the nonfield projects, it should be noted that the work of compilation from aerial photographs was carried on for more than 8 months in Juneau, Alaska, with a drafting force that had been assembled mainly in that locality. Toward the later part of the field season of the chief Alaskan geologist was temporarily relieved of his Survey duties, and for nearly 5 months he served as representative for Alaska of the Federal Emergency Administration of Public Works, spending all of that time in the Territory.

Owing to the allotment of funds from the Public Works Administration it was possible to expand somewhat the Alaska program of the Geological Survey in the winter of 1933–34 and to send out the parties for the season of 1934 more adequately manned. As a result 9 principal projects, 7 of which involved new field work, were started during that period, though all of them will extend over into the next fiscal year. Of these field projects, 5 were primarily concerned with geologic investigations and 2 with topographic mapping. The projects involving new geologic field work were located in the area adjacent to Ketchikan in southeastern Alaska; part of the Alaska Range, including the headwater region of the Copper River Valley and parts of the Tanana Valley; the Kaiyuh Mountains, which lie south and east of the Yukon River in the region west of Ruby and southeast of Kaltag; the northern and eastern part of Kodiak Island, in southwestern Alaska; and the coal fields adjacent to Eska, in the Matanuska district of the Cook Inlet-Susitna region. The Eska work was financed by and carried on at the request of the Alaska Railroad and mainly in its interest. The topographic projects include the mapping of an extensive tract of Admiralty Island and adjacent parts of the Juneau district, in southeastern Alaska, and mapping of parts of the Alaska Range at the head of the Copper River, especially in the vicinity of Mentasta Pass and Suslota Lake. The two projects not directly involving new field work were the continuation of the compilation of drainage maps of southeastern Alaska from the airplane photographs taken by the Navy Department and the annual canvass of mineral production.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 46.1 percent mapped, the year's increment amounting to 0.5 percent. The area covered by topographic base maps without contours and prepared from aerial photographs after field examinations continued large. The resurveys in large part covered areas previously surveyed on a smaller scale.

New topographic surveys of the United States, July 1, 1933, to June 30, 1934, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—						Total area mapped in fiscal year (square miles)			Total area mapped to June 30, 1934 (square miles)	Percentage of total area of State mapped to June 30, 1934	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000 or larger	24,000	31,680	48,000	62,500	125,000	Revision	Resurvey	New survey					
Alabama	20					310			238	72	21,563	41.5	295	253	
Arizona	25, 50				36	1,069		245	452	408	59,747	52.4	1,224		82
Arkansas	10, 20, 50		[1] 52			749			295	454	23,139	43.4	335	468	
California	2, 4, 5, 25, 50, 100	[2] [3] 3	298	141		401	1,666	306	1,747	456	132,593	83.8	815		60
Colorado	20, 50, 100			5	[2] 103	261			103	266	56,608	54.5	430	354	10
Connecticut											4,965	100.0	27		
Delaware	10					54			54		2,370	100.0	48		
District of Columbia											70	100.0			
Florida	10, 20					785				785	5,503	9.4	625	593	
Georgia	5, 20	[2] [4] 9				248			242	15	24,952	42.1	301	242	
Idaho	10, 25, 50, 100		[2] 65			20	200		65	220	32,904	39.2	479		39
Illinois	5, 10, 20					1,351		44	212	1,095	37,696	66.5	19		
Indiana	20					17				17	3,685	10.1	208	75	
Iowa											13,167	23.5	185	130	
Kansas	10			191		96				287	64,446	78.4	263	236	4
Kentucky	20					296				296	26,916	66.3	154	274	
Louisiana	5, 20			[2] [5] 2,190		508				1,397	11,330	23.4	475	127	
Maine	20					211				211	20,984	63.5	61		
Maryland	20					184			184		12,327	100.0	243	267	
Massachusetts	10			224					224		8,266	100.0	1,039		
Michigan	5			[2] [6] 291					5		14,069	24.3	50	168	
Minnesota	20					57				57	8,214	9.7	119	262	
Mississippi	20					256				256	7,010	15.0	177	154	
Missouri	5, 10, 20		82	364		2,186			650	1,982	48,775	70.3	1,220	1,222	
Montana	25, 100					56	20			76	43,528	29.6	178		14
Nebraska	10					235				235	27,352	35.3	230	297	
Nevada	50, 100					22	362			384	53,718	48.5	450		31
New Hampshire											9,302	100.0			
New Jersey	5, 10	[2] [4] 5		5					10		8,224	100.0	96	109	
New Mexico	20, 50			16		1,016			272	760	43,677	35.6	661		58
New York	20					221			221		49,204	100.0	43	116	

[1] Lithographic publication. Final publication 1:62,500.
[2] Lithographic publication only.
[3] Mapped on scale of 1:4,800.
[4] Mapped on scale of 1:9,600.
[5] Includes 1,301 square miles of culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.
[6] Includes 286 square miles of culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.

North Carolina	1, 2, 5, 10, 50	(27)		295		259			554		19,040	36.3	547		37
North Dakota	5		[1] 20			20				20	13,168	18.6	73	164	
Ohio	5			59					59		41,040	100.0	107	119	
Oklahoma	5, 10, 20		[1] 86			554			554		41,927	59.8	228	203	
Oregon	50, 100					216	403		147	472	36,932	38.2	160		
Pennsylvania	20					657			125	532	38,760	85.9	419	560	
Rhode Island											1,248	100.0	49		
South Carolina	10, 20					836				836	14,573	47.0			
South Dakota	20					112				112	19,355	24.9	159	252	
Tennessee	1, 5, 10, 50	(28) [3] [4] 6		68		111			179	6	23,633	56.2	284	42	98
Texas	20, 50					930		92		838	89,331	33.6	514	558	7
Utah	5, 20, 100		[3] 59				100			159	19,981	23.5	427		35
Vermont	20					107				107	8,246	86.2	199		
Virginia	10, 20, 50		[2] 106	164		569			839		37,897	88.9	657	247	194
Washington	25, 50, 100					204	182			386	37,601	54.4	15	21	
West Virginia	5	[3] [9] 2							2		24,170	100.0	2	13	
Wisconsin	20					82				82	19,237	34.3			
Wyoming	5, 50, 100	[10] 2				18	215		20	215	31,823	32.5	86		
Total continental United States (exclusive of Alaska).		27	768	4,013	139	15,284	3,148	687	7,453	13,494	1,394,266	46.1	14,376	7,526	669
Hawaii											6,435	100.0			
Puerto Rico													238		82

[3] Lithographic publication only.
[4] Mapped on scale of 1:9,600.
[7] 138 acres mapped on scale of 1:1,200.
[8] 6 acres mapped on scale of 1:4,800.
[9] Mapped on scale of 1:2,400.
[10] Mapped on scale of 1:4,800.

FIELD SURVEYS

Through the use of regularly appropriated funds and of funds made available by the Federal Emergency Administration of Public Works and by the Tennessee Valley Authority topographic mapping was undertaken in most of the States. Public Works projects and Tennessee Valley projects are indicated below by the initials "P.W." and "T.V.A." Cooperation with States was continued on a smaller scale than in recent years, and some projects begun under cooperative or Federal allotments were completed by Public Works funds.

Alabama.—The survey of the Blocton 15′ quadrangle (P.W.) was completed, and that of the Palos, Basham, and Mount Hope 15′ quadrangles (P.W.) was begun.

Arizona.—The survey of the Quartzsite No. 3 quadrangle was completed for the Office of Indian Affairs. The survey of the Castle Dome Peak No. 2 15′ quadrangle (P.W.) and an extension of the Petrified Forest National Monument (P.W.) was completed, and that of the Castle Dome Peak No. 3, Payson No. 1, Payson No. 2, Payson No. 3 15′ quadrangles (P.W.) and Grand Canyon National Monument (P.W.) was begun.

Arkansas.—For the Forest Service the survey of the Mount Judea 15′ quadrangle was completed, and that of the Swain 15′ quadrangle was begun. For the Forest Service the survey of the Ozone 15′ quadrangle (P.W.) was completed. The survey of the Magazine Mountain No. 3 15′ quadrangle (P.W.) was completed, and that of the Watalula 15′ quadrangle (P.W.) and the Alexander No. 1 7½′ quadrangle (P.W.) as a part of the Alexander 15′ quadrangle (P.W.) was begun.

California.—In cooperation with the State engineer of California the survey of the Eureka and Lakeport 15′ quadrangles, the Halls Flat, Yreka, and Bogus 30′ quadrangles, and the Cucamonga No. 1 7½′ quadrangle was completed, and that of the Sebastopol 15′ quadrangle was begun. In cooperation with the county surveyor of Los Angeles County the survey of the Glendora, La Verne, Sunland, Mount Lowe, Azusa, La Crescenta, Sierra Madre, Little Tujunga, Camp Baldy, and Evey Canyon 6′ quadrangles was completed, and that of the Mount Wilson, Chileno Canyon, Camp Rincon, Acton, and Camp Bonita 6′ quadrangles was begun. The survey of the Parkfield No. 1 and Dudley No. 2 7½′ quadrangles (P.W.) was completed, and that of the Paynes Creek and Burney 30′ quadrangles (P.W.) and the Yosemite Valley National Park (P.W.) was begun.

Colorado.—At the request of the Forest Service the survey of the Mount Powell No. 2 15′ quadrangle was completed and the survey of the Mount Powell No. 1 15′ quadrangle (P.W.) was completed. The survey of the Como No. 2 15′ quadrangle (P.W.) was continued, and that of the Cherry Creek area (P.W.), Black Canyon National Monument (P.W.), and Colorado National Monument (P.W.) was begun.

Delaware.—The survey of the Deepwater Point 15′ quadrangle (P.W.) was completed.

Florida.—The survey of the Boggy and West Juniper Creek 15′ quadrangles (P.W.) was completed, and that of the Oscar, De Funiak Springs, and Mary Esther 15′ quadrangles (P.W.) was begun.

Georgia.—The survey of the Chickamauga-Chattanooga National Military Park (P.W.) was completed, and that of the Bullochville and Thomaston 15′ quadrangles (P.W.) was begun.

Idaho.—The Bureau of Mines and Geology of Idaho cooperating, the survey of Grimes Pass and vicinity was completed. The survey of the Dickey 30′ quadrangle and American Falls No. 2 and American Falls No. 3 15′ quadrangles (P.W.) was begun.

Illinois.—The survey of the Toledo, Hoopeston, Metamora, Petersburg, Genoa, Carthage, Dunlap, Lacon, and Mount Vernon 15′ quadrangles was completed, and that of the Toluca, Camp Grove, Morrison, Oquawka, and Iuka 15′ quadrangles was continued in cooperation with the Department of Registration and Education of Illinois, Geological Survey. The survey of the Sycamore 15′ quadrangle (P.W.) was continued and that of the Shabbona 15′ quadrangle (P.W.) was begun.

Indiana.—The survey of the Heltonville, Oolitic, and Porter 15′ quadrangles (P.W.) was begun.

Kansas.—The survey of the Waldron No. 1, Waldron No. 4, Armourdale No. 2, Armourdale No. 3, Armourdale No. 4, and Olathe 1–a 7½′ quadrangles (P.W.) was completed, and that of the Armourdale No. 1 7½′ quadrangle (P.W.) and the western part of the Waldron 15′ quadrangle (P.W.) was begun.

Kentucky.—The survey of the Sadieville 15′ quadrangle (P.W.) was completed, and that of the Munfordville and Cecilia 15′ quadrangles (P.W.) was begun.

Louisiana.—The Louisiana Board of State Engineers cooperating, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was completed for topographic base maps without contours for the 7½′ quadrangles within the Hackberry, Bayou Bois Courier, Johnsons Bayou, Grand Lake West, Lake Charles, Orange, Redfish Point, Port Arthur, Pecan Island, Grand Lake East, Sabine Pass, AAA, BBB, and CCC 15′ quadrangles and begun for the 7½′ quadrangles within the Mount Airy, Donaldsonville, Bonnet Carre, Spanish Fort, Crowley, and Lafayette 15′ quadrangles. For the Louisiana Board of State Engineers the survey for the contours of the 7½′ quadrangles within the Hackberry, Bayou Bois Courier, Johnsons Bayou, and Grand Lake West 15′ quadrangles (P.W.) was completed. The survey of the Pollock and Colfax 15′ quadrangles (P.W.) was completed.

Maine.—In cooperation with the Public Utilities Commission of Maine, the survey of the Rangeley 15′ quadrangle was completed.

Maryland.—The survey of the Prince Frederick, Leonardtown, and Patuxent No. 2 15′ quadrangles (P.W.) was begun.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, the survey of the Sagamore, Manomet, Springfield No. 1, Mittineague, and Long Meadow 7½′ quadrangles was completed, and that of the Plymouth No. 2, Springfield No. 2, and Northampton No. 3 7½′ quadrangles was begun.

Michigan.—In cooperation with the Department of Conservation of Michigan, Geological Survey, the ground control, field examination and preparation from aerial photographs of culture, drainage, and woodland was executed in 7½′ quadrangles for topographic base maps without contours for the Mesick 15′ quadrangle and the Wexford County part of the Tustin 15′ quadrangle. The survey of the Sanford 15′ quadrangle and the Toledo No. 1 and Maumee Bay No. 2 7½′ quadrangles (P.W.) was begun.

Minnesota.—At the request of the Forest Service the survey of the Ely 15′ quadrangle was completed. The survey of the Fountain City 15′ quadrangle (P.W.) was begun.

Mississippi.—The survey of the Raymond 15′ quadrangle (P.W.) was completed, and that of the Edwards 15′ quadrangle (P.W.) was begun.

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri the survey of the West St. Louis No. 1, West St. Louis No. 2, West

St. Louis No. 3, West St. Louis No. 4, Independence 4–c, Camp Clark, and Blue Springs 7½′ quadrangles and the Red Bird, Celt, Marble Hill, Marquand, Steelville, and Sleeper 15′ quadrangles was completed; that of the Upalika, Greenville, Stone Hill, Grove Spring, Big Piney, Gatewood, Berryman, Topaz, Zanoni, Manes, and Fordland 15′ quadrangles and the Springfield No. 4, Sullivan No. 3, Sullivan No. 4, and Versailles No. 4 7½′ quadrangles was continued; and that of the Van Buren and Fielden 15′ quadrangles and the Stockton No. 3, Stockton No. 4, Kimmswick No. 1, Independence 3–a, Independence 3–c, Independence 4–b, and Independence 4–d 7½′ quadrangles was begun. The survey of the Canaan 15′ quadrangle (P.W.) and Harrisonville 2–b and Olathe 1–a 7½′ quadrangles (P.W.) was completed, and that of the Lynn 15′ quadrangle (P.W.) and the Armourdale No. 4 7½′ quadrangle (P.W.) was begun.

Montana.—The survey of the Thompson 30′ quadrangle (P.W.) and of the Dupuyer No. 2 15′ quadrangle (P.W.) was begun.

Nebraska.—The survey of the Seward No. 1 and Seward No. 2 15′ quadrangles (P.W.) was begun.

Nevada.—The survey of the Skelton 30′ quadrangle and of the Gold Creek No. 4 15′ quadrangle (P.W.) was begun.

New Hampshire.—The survey of the Whitefield 15′ quadrangle (P.W.) was begun.

New Jersey.—The survey of the Morristown National Historical Park (P.W.) was completed, and that of the Ramapo No. 4 7½′ quadrangle (P.W.) was begun.

New Mexico.—At the request of the Office of Indian Affairs the survey of the Shiprock No. 2 and Carrizo Mountains No. 1 15′ quadrangles (P.W.) was completed. The survey of the Shiprock No. 1 and Shiprock No. 3 15′ quadrangles (P.W.) and the Carlsbad Cavern National Park (P.W.) was completed, and that of the Carrizozo No. 4 and Arabela No. 3 15′ quadrangles (P.W.) was begun. In preparation for geologic mapping the survey of the Queen No. 3 15′ quadrangle was begun.

New York.—The survey of the Catskill 15′ quadrangle was completed, and that of the Rhinebeck 15′ quadrangle was continued in cooperation with the Department of Public Works of New York. The survey of the Binghamton 15′ quadrangle (P.W.) was begun.

North Carolina.—The survey of the Guilford Courthouse National Military Park (P.W.) was completed, and that of the Corundum and Farner 15′ quadrangles (P.W.) was begun. For the Forest Service the survey of the Ranger 15′ quadrangle (P.W.) was continued; that of the Table Rock No. 2, Old Fort No. 2, Montreat No. 1, and Democrat No. 4 7½′ quadrangles (T.V.A.) was completed, and that of the Spruce Pine No. 1, Spruce Pine No. 2, Spruce Pine No. 3, Spruce Pine No. 4, Bakersville No. 1, Bakersville No. 2, Bakersville No. 3, Bakersville No. 4, Elk Park No. 1, Elk Park No. 2, Elk Park No. 3, and Blowing Rock No. 2 7½′ quadrangles (T.V.A.) was begun.

North Dakota.—The survey of the Grand Forks No. 1 7½′ quadrangle (P.W.) as a part of the Grand Forks 15′ quadrangle (P.W.) was begun.

Ohio.—The survey of the Maumee Bay No. 1 7½′ quadrangle (P.W.) was completed, and that of the Maumee Bay No. 2 and Toledo No. 4 7½′ quadrangles (P.W.) was begun.

Oklahoma.—The survey of the Norman and Moore 15′ quadrangles (P.W.) and of the Moore 7½′ quadrangle (P.W.) was completed, and that of the Edmond 15′ quadrangle (P.W.) and the Edmond 7½′ quadrangle (P.W.) was begun.

Oregon.—For the Forest Service the survey of the McKenzie Bridge 30′ quadrangle (P.W.) was begun. The survey of an extension of the Crater Lake National Park (P.W.) was continued for the National Park Service. The survey of the Disston 30′ quadrangle (P.W.) was begun.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, the survey of the Smethport and Coudersport 15′ quadrangles was completed, and that of the Kane and Allentown 15′ quadrangles was begun. The survey of the Mifflintown 15′ quadrangle (P.W.) was begun.

South Carolina.—The survey of the Hagood 15′ quadrangle (P.W.) was completed, and that of the Wellford, Greenville, Killian, and Camden 15′ quadrangles (P.W.) was begun.

South Dakota.—The survey of the Fort Pierre 15′ quadrangle (P.W.) was begun.

Tennessee.—The survey of the Shiloh National Military Park including Cherry House (P.W.) was completed, that of the Tellico Plains and Farner 15′ quadrangles (P.W.) was begun, that of the Elk Park No. 2 7½′ quadrangle (T.V.A.) was completed, and that of the Bakersville No. 1 and Bakersville No. 2 7½′ quadrangles (T.V.A.) was begun.

Texas.—In preparation for geologic mapping the survey of the Guadalupe Peak No. 2 quadrangle was completed. The survey of the Wildorado No. 1, Amarillo No. 2, and Dumas No. 3 15′ quadrangles (P.W.) was completed, and that of the Longview No. 3 and Dumas No. 4 15′ quadrangles (P.W.) was begun.

Utah.—The survey of Salt Lake County (P.W.) was continued, and that of the Theodore 30′ quadrangle (P.W.) was begun.

Vermont.—In cooperation with the State geologist of Vermont the survey of the Guildhall 15′ quadrangle was completed, and that of the Woodsville 15′ quadrangle was begun.

Virginia.—The survey of the Pulaski and Waynesboro 15′ quadrangles and the Richmond No. 3 and Richmond No. 4 7½′ quadrangles was completed, and that of the Richmond No. 1 7½′ quadrangle and the Mount Rogers and Mouth of Wilson 15′ quadrangles was begun, in cooperation with the Conservation and Development Commission of Virginia, Geological Survey. The survey of the Fredericksburg-Spottsylvania Battlefield National Monument (P.W.) and the Balcony Falls and Amherst 15′ quadrangles (P.W.) was begun.

Washington.—The survey of the Olympia 15′ quadrangle (P.W.) was completed, that of the Mount Constance, Eatonville, and Metaline 30′ quadrangles (P.W.) was continued, and that of the Fort Simcoe 30′ quadrangle (P.W.) was begun.

West Virginia.—In cooperation with the Division of Subsistence Homesteads the survey of the Arthurdale Farm Project, near Reedsville, Preston County, was completed.

Wisconsin.—The survey of the Chippewa Falls 15′ quadrangle (P.W.) was continued.

Wyoming.—For the Forest Service the survey of the Savery Creek quadrangle was completed. The survey of the Devils Tower National Monument (P.W.) was completed, and that of the Grand Teton National Park (P.W.) and Grand Encampment 30′ quadrangle (P.W.) was begun.

WATER-RESOURCES BRANCH

The importance of water and of records related to the quantity, chemical quality, and availability of both surface and ground waters has become increasingly apparent during the year. The growth of the country in population with consequent increases in demands for water and especially the continued series of dry years which has culminated in the disastrous and widespread drought in 1934 have served to impress on all the people the controlling importance of

water in our surface streams and in underground basins in relation to many of man's activities. The Public Works Administration has found the information with respect to water to be invaluable in its study of projects of all classes and in all sections of the country and has relied on the records of the Geological Survey as a basis for its action on many projects.

Reliable information with respect to these supplies of water and to their fluctuations with variations in rainfall is essential to orderly, stable, and economic development along many lines and, therefore, to the national welfare. The work of the water-resources branch thus assumes a position of great importance in the economic affairs of the Nation.

The water-resources investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations were conducted for the following Federal bureaus through advance, transfer, or repay of funds:

Department of Agriculture:
- Office of Experiment Stations
- Weather Bureau
- Forest Service
- Bureau of Biological Survey

Department of the Interior:
- Division of Subsistence Homesteads
- Office of Indian Affairs
- Bureau of Reclamation
- National Park Service

Department of Justice: Bureau of Prisons
Department of the Navy: Bureau of Yards and Docks
Department of State
Department of War: Office of the Chief of Engineers
Federal Power Commission
Tennessee Valley Authority
Federal Emergency Administration of Public Works

States.—The following amounts were made available by States and municipalities for cooperative surface- and ground-water investigations. In addition to the results obtained directly from cooperation, it is estimated that data valued at over $145,000 were furnished by cooperating officials.

Cooperative State and municipal funds available for work on water-resources investigations, fiscal year 1934

State	State funds available		Municipal funds available		Total
	Surface water	Ground water	Surface water	Ground water	
Arizona			$3,200.00		$3,200.00
Arkansas	$0.13				.13
California	25,000.00		17,250.00	$7,000.00	49,250.00
Colorado	16,000.00				16,000.00
Connecticut	6,000.00		100.00		6,100.00
Florida	3,021.63		1,500.00		4,521.63
Hawaii	14,684.08	$7,091.58			21,775.66
Idaho	20,845.33				20,845.33
Illinois	5,400.00				5,400.00
Indiana	4,000.00		300.00		4,300.00
Iowa	5,514.00				5,514.00
Kansas	7,037.99				7,037.99
Louisiana			415.00		415.00
Maine	6,500.00				6,500.00
Maryland	8,099.87		1,724.75		9,824.62
Massachusetts	5,301.29		1,600.00		6,901.29
Michigan	1,800.00	2,294.28			4,094.28
Minnesota	5,108.00				5,108.00
Mississippi	1,000.00				1,000.00
Missouri	8,688.40		326.60		9,015.00
Montana	6,000.00				6,000.00
Nebraska	12,000.00	3,000.00			15,000.00
Nevada	800.00				800.00
New Hampshire	3,750.00				3,750.00
New Jersey	10,000.00	3,802.60			13,802.60
New Mexico	14,819.99	2,772.65			17,592.64
New York	15,914.90	2,000.00	5,287.66	4,400.00	27,602.56
North Carolina	4,500.00	200.00			4,700.00
North Dakota	100.00				100.00
Ohio	17,346.98		2,200.13		19,547.11
Oregon	24,575.76	1,022.66	866.73	500.00	26,965.15
Pennsylvania	20,085.73	1,500.00			21,585.73
South Carolina	1,750.00		399.37		2,149.37
Tennessee	11,012.52	1,000.00			12,012.52
Texas	21,636.87	15,285.95			36,922.82
Utah	5,500.00		119.82	6,571.23	12,191.05
Vermont	4,184.00				4,184.00
Virginia	19,000.00	994.86			19,994.86
Washington	11,126.95	300.00	5,846.06		17,273.01
West Virginia	3,000.00				3,000.00
Wisconsin	7,000.00				7,000.00
Wyoming	8,250.00				8,250.00
	366,354.42	41,264.58	41,136.12	18,471.23	467,226.35

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the commission to perform such field work as may be assigned to them by the commission. The operation of about 320 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 130 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operations under permits and licenses of the commission in connection with 100 projects. Examination and reports on applications for projects have been made for the commission as requested.

WORK OF THE YEAR BY DIVISIONS

The division of surface water conducts investigations of surface water, which consist of the measurement of the flow of rivers, conducted in the 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and

records of stage and other data are collected, from which the daily discharge of the rivers is computed. In this work 41 States, the Territory of Hawaii, and several Federal bureaus and individuals cooperated in the maintenance of the 2,941 regular gaging stations that were in service at the end of the year. Records for about 124 additional gaging stations were received, ready for publication, from Federal bureaus and from individuals.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for drilling wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year about 65 investigations relating to ground water and reservoir sites were in progress, and work was done in 28 States and the Territory of Hawaii, in cooperation with State or local governmental agencies, or on Public Works Administration Federal projects. In the hydrologic laboratory 383 samples of water-bearing material were analyzed.

The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health) so far as such use is affected by the dissolved mineral matter. The analysis (partial or complete) of 1,226 samples of water, including some for nearly all the studies of ground water in the different States, was completed during the year.

The work of the division of power resources comprised the preparation of monthly reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported, an annual report containing revised figures of the monthly production of electricity and consumption of fuel in 1933 previously published in the monthly reports, a report on the developed water power of the United States, and compilations of stocks of coal held by public-utility power plants for inclusion in reports of commercial stocks of coal

undertaken quarterly by the Bureau of Mines of the Department of Commerce. The annual report on the capacity of water wheels in water-power plants in the United States was released February 3, 1934, and the final report on the monthly and annual production of electricity for public use in 1933 was released April 30, 1934.

The division of water utilization investigates problems affecting the utilization and control of the waters of streams and performs administrative work relating to supervision and investigation of these problems by the field organization of the water-resources branch and of power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water.

CONSERVATION BRANCH

The functions of the conservation branch, including the classification of public and quasi-public lands with respect to mineral, water power, and agricultural value, and the technical supervision of mineral and power development on such lands, were increased in volume and scope during the fiscal year. Their performance, however, was seriously impaired by want of adequate funds, by consequent loss of experienced personnel, and by practical cessation of the normal inflow of basic data from field sources.

The following table indicates in part the dependence of public-land administration on land-classification phases of branch work and summarizes activity in the Washington office with respect to specific cases submitted in accordance with departmental procedure for technical report, review, or approval. The terms "gain" and "loss" signify, respectively, decrease and increase in the number of cases pending. Compared with 1933, this tabulation shows increase of 6 percent in cases received, decrease of 17 percent in cases acted on, and increase of 78 percent in cases pending at the end of the year.

General summary of cases involving land classification

Class of cases	Record for fiscal year 1934						Record since receipt of first case	
	Pending July 1, 1933	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1934	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General	307	1,208	1,515	1,392	123	+184	-------	-------
Time extensions	-------	-------	-------	-------	-------	-------	2,313	2,313
Oil development	10	78	88	77	11	−1	17,294	17,283
Concurrence	19	686	705	651	54	−35	-------	-------
Section 27 cases	-------	-------	-------	-------	-------	-------	39	39
Committee cases: Oil and potash	3	1,814	1,817	1,687	130	−127	11,232	11,102
Applications for classification as to mineral:								
Oil	74	2,344	2,418	2,274	144	−70	26,156	26,012
Miscellaneous	7	10	17	16	1	+6	917	916
Applications for mineral permits	78	1,813	1,891	1,622	269	−191	59,560	59,291
Applications for mineral leases	5	141	146	135	11	−6	2,018	2,007
Applications for patent, potassium	-------	-------	-------	-------	-------	-------	124	124
Federal Power Commission cases:								
Preliminary permits	17	32	49	47	2	+15	315	313
Licenses	-------	-------	-------	-------	-------	-------	28	28
Determinations under section 24	22	66	88	81	7	+15	491	484
Applications for classification as to power resources	10	18	28	25	3	+7	531	528
Applications for agricultural classification	37	132	169	128	41	−4	1,484	1,443
Applications for rights-of-way	38	114	152	144	8	+30	6,990	6,982
Irrigation project reports	2	3	5	5	-------	+2	938	938
Applications under enlarged homestead acts	16	151	167	100	67	−51	57,940	57,873
Applications under stock-raising-homestead acts	859	3,023	3,882	2,073	1,809	−950	142,475	140,666
Applications under Ground Water Reclamation Act	2	6	8	6	2	-------	987	985
Indian Office requests for information	-------	1	1	1	-------	-------	9,548	9,548
	1,506	11,640	13,146	10,464	2,682	−1,176	-------	-------

MINERAL CLASSIFICATION DIVISION

The work of the mineral classification division was restricted rather closely during the year to office phases indispensable to appropriate departmental action on current applications for public-land use under the mineral-leasing laws or for disposition under the nonmineral-land laws. A few imperative case investigations were made in the field, however, and one regional survey of importance begun in 1933 was completed.

Types of office activity indicated in the general summary of cases involving land classification were increased during the year to include determinations pursuant to departmental circular no. 1303, whether in specific cases the grant of surface rights in Federal lands will tend seriously or substantially to impede prospecting and development under the mineral-leasing laws, and to include the drafting for the departmental committee of its recommendations of action on applications for extension of time for compliance with the terms of outstanding oil and gas prospecting permits and potash permits.

Availability of the results of geologic surveys made prior to 1934 permitted some progress in classifying the vast areas of public land withdrawn more than a quarter of a century ago for mineral examination and classification. Classifications effected include 482,840 acres as coal land, 593,834 acres as noncoal land, with a net reduction of outstanding coal withdrawals by 946,433 acres.

Summary of outstanding mineral withdrawals and classifications, June 30, 1934, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	Withdrawn	Classified as coal land	Withdrawn	Classified as oil land	Withdrawn	Classified as oil shale land	Withdrawn	Classified as phosphate land	Withdrawn
Alaska		56,993							
Ariz	139,415								
Ark		61,160							
Calif	17,603	8,720	1,178,392						90,324
Colo	4,142,233	3,082,272	215,370		1,172,778	952,239			
Fla							66,796	120	
Idaho	11,520	4,603					276,239	270,036	
La			466,990	4,233					
Mont	6,442,830	[1] 9,254,927	1,336,697	67,651			279,944	3,833	
Nev	83,673								39,422
N.Mex	4,124,578	984,829							9,282,160
N.Dak	5,954,364	11,178,286	84,894						
Oreg	4,361	18,887							
S.Dak		250,093							
Utah	3,404,043	1,267,697	[2] 1,344,473		2,737,274	2,703,755	277,344	2,937	
Wash	691,801	141,444							
Wyo	2,260,604	[3] 6,741,748	541,777		2,328,370	406,003	989,133	25,293	
	27,277,025	33,051,659	5,168,593	71,884	6,238,422	4,061,997	1,889,456	302,219	9,411,906

[1] Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).
[2] Includes 13,578 acres withdrawn as helium reserve.
[3] Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

Division activity precedent to administration of the mineral-leasing laws included primary findings of pertinent technical fact affecting the adjudication of 1,622 current filings for prospecting permit, of 135 current filings for lease, and of 2,290 conflicts or anticipated conflicts between mineral and nonmineral claimants; the technical review with ultimate concurrence in 651 approvals of assignment and authorizations of mineral lease or license; the preparation for the departmental committee of abstracts and recommendations affecting the grant of time extensions on 1,687 outstanding prospecting permits for oil and gas or potash; and the preparation and promulgation of definitions of the "known geologic structure" of six producing oil and gas fields, as follows:

Definitions of "known geologic structure", fiscal year 1934

State	Field	Date promulgated	Acres
Montana	North Bowes	Aug. 25, 1933	1,880
Do	South Bowes	Aug. 25, 1933	3,240
Do	Dry Creek	Jan. 6, 1934	6,081
New Mexico	North Eunice (additional)	Sept. 2, 1933	280
Wyoming	Lake Creek	Aug. 25, 1933	2,273
Do	La Barge	Oct. 3, 1933	1,641

The aggregate area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1934, was 960,346 acres in California, Colorado, Montana, New Mexico, Oklahoma, Utah, and Wyoming.

POWER DIVISION

During the fiscal year 1934 the work of obtaining basic information as to the water-power resources of public lands and of making it available for use in the administration of the public-land laws was directed chiefly to its field phases. Field work made possible by funds allotted by the Public Works Administration was materially expanded, and long deferred surveys of the power resources of important streams were undertaken in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. These surveys involved about 1,400 linear miles of streams and included supplemental geologic or geophysical studies of foundation material and conditions at six dam sites in Colorado, Oregon, and Utah.

Office activities not indicated in the general summary of cases involving land classification resulted in additions of 148,714 acres to outstanding power reserves in 12 States, eliminations of 31,153 acres from such reserves in 8 States, and net increase of the total area of such reserves in 22 States to 6,800,371 acres. Field supervision of power projects for the Federal Power Commission involved investigation and report on 16 projects, construction and operation on 132 projects, and cost accounting on 3 projects.

Returns for the calendar year 1933 disclose the total installed capacity of the systems operated by the holders or users of rights-of-way for power purposes granted by the Secretary of the Interior as 5,855,000 horsepower. The total energy generated in that year was 9,182,000,000 kilowatt-hours, an increase of 28 percent over the output reported in 1932—an increase that is simply statistical, however, and due to the return for 1933 of certain items not previously returned rather than to any material increase in actual output. Revenues accrued from the use and occupancy of public lands under power permits and grants issued by the Secretary of the Interior aggregated

$190,194 from 1912 to 1933, and $15,145.31 additional has been assessed for the calendar year 1934. Accrued charges for unauthorized occupancy of public lands by power projects prior to the issuance of license therefor by the Federal Power Commission amount to $111,826.58 additional, about $12,000 of which is before the courts for adjudication.

AGRICULTURAL DIVISION

Although the number of applications currently received for agricultural classification, for designations under the stock-raising and enlarged homestead acts and Nevada ground-water act, and for approval of irrigation projects decreased about 9 percent compared with 1933, the number of cases pending on June 30, 1934, was 109 percent greater than on June 30, 1933.

Office activities not indicated in the general summary of cases resulted in the designation of 508,193 acres in 16 States as subject to the stock-raising homestead act, cancelation of prior designations under that act to the extent of 5,470,887 acres in 7 States, and net reduction of the outstanding designated area in 20 States to 119,339,-332 acres; the designation of 5,256 acres in 11 States as subject to the enlarged homestead acts, cancelation of prior designations under those acts to the extent of 15,089,655 acres in 4 States, and net reduction of the outstanding designated area in 14 States to 294,413,-685 acres; the inclusion of 8,607 acres in 8 States in public water reserves, exclusion of 1,080 acres in 4 States from such reserves, and net increase of the gross area reserved in 13 States to 494,728 acres; and the designation of 8,800 acres under the Nevada ground-water act, with increase of the aggregate area so designated to 1,729,495 acres. Liaison service was maintained for the Interior Department with the committee for acquisition of submarginal land, of the Federal Emergency Relief Administration, and considerable assistance was rendered to members and committees of Congress concerned with the framing and enactment of the Taylor grazing law (Public No. 482, 73d Cong.).

MINING AND OIL AND GAS LEASING DIVISIONS

The work of the mining and oil and gas leasing divisions consists of the exercise of supervisory jurisdiction over mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves.

In spite of an increase during the year of 877, or 14 percent, in the number of Federal properties under supervision, inspectional and regulatory activities, already substantially below the limit of prudent administration, were of necessity further reduced. In their stead remedial activities, required to eradicate the injurious consequences of insufficient Federal supervision in previous years, were undertaken

with funds provided for the purpose by the Public Works Administration.

Field supervision, exercised through 22 offices and suboffices in the public-land States and Alaska, was increased during the year by the issuance of Federal leases, licenses, and prospecting permits for 1,247 additional properties. In the same period leases, licenses, and permits for 368 properties were terminated.

Federal properties under supervision at the end of the fiscal year, indicated in detail in the summary of field operations by States, numbered 7,154 in 19 States and Alaska and involved an aggregate of 9,541,487 acres. They contained 4,236 productive oil and gas wells, 38 of which were completed during the year, 528 coal mines, 2 potassium mines, 1 phosphate mine, 3 sodium plants, 1 oil-shale plant, and a great variety of prospecting operations.

By order of the Secretary dated September 12, 1933, the supervisory function of these divisions was enlarged to include the receipt, for transmission to the General Land Office, of all remittances made in payment of rents and royalties accrued under mineral leases and prospecting permits involving public land and the maintenance of records showing the current status of each account.

Especial activity resulted from a departmental order dated July 12, 1933, requiring that on and after May 1, 1933, the Government royalty on petroleum be computed on the volume of production as determined by tank measurement based on 100 percent tank tables and calculated as barrels of clean oil of 42 standard United States gallons each; from departmental grants of drilling and production relief to numerous operators on Federal lands with corresponding increase of supervisory obligation to determine and assess the monthly charges due to the Government as compensation for any loss of royalty entailed; from departmental instructions of May 16, 1934, obligating supervisors to determine production proration between Federal lands and other lands in areas served by pipe lines occupying rights of way pursuant to the act of February 25, 1920 (41 Stat. 437), and to pass on the rates and terms of transportation and purchase of production in such areas; from increased submissions of proposed plans for the unit operation and development of oil and gas fields involving public land, for consideration and technical approval; and from cooperation with the Petroleum Administrative Board of the National Recovery Administration in facilitating throughout the public-land States the submission of the development plans for new pools required by article III, section 7, of the Code of Fair Competition for the Petroleum Industry.

In the field of mine supervision especial activity resulted from a marked increase of irresponsible trespass on Federal-owned coal lands, with the consequent starting of a large number of outcrop

fires and the filing of many complaints by royalty-paying lessees and permittees of total or partial loss of their coal market by reason of unauthorized unsupervised competition; and from the necessity for local surveys of coal supply and demand as basis for appropriate recommendations under departmental order of January 24, 1934, restricting the issuance of coal prospecting permits and leases to localities whose coal needs cannot feasibly be supplied by existing mines.

Mineral production during the year from lands under Federal leases, licenses, and prospecting permits and revenue accrued therefrom in the form of royalty, rental, or bonus are shown below:

Mineral production from public lands and revenues accrued therefrom, fiscal year 1934

State	Petroleum (barrels)	Natural gas (M cubic feet)	Gas gasoline (gallons)	Coal (short tons)	Potassium (short tons)	Sodium (short tons)	Phosphate (short tons)	Accrued revenue
Alaska				100,347.10				$8,408.37
Ala				106,796.00				10,679.60
Calif	13,276,129.07	36,573,146	58,907,584.00	5.00		45,048.00		2,048,161.49
Colo	417,341.07	1,030,944	16,609.00	313,675.93				75,697.63
Idaho				2,749.13			43,066.91	3,616.97
La	1,756.61	1,383,908	31,757.08					16,886.37
Mont	305,003.11	1,445,773		253,607.43				71,113.05
Nev								480.00
N.Mex	2,456,898.10	6,421,645	1,033,534.76	34,612.68	289,836.99	781.56		256,655.11
N.Dak				386,149.76				23,711.40
Okla	295,810.65		34,891.99					34,244.71
Oreg				86.50				221.63
S.Dak				2,574.26				427.53
Utah	2,850.73	35,860		710,768.70				92,420.01
Wash				37,551.33				3,755.13
Wyo	8,299,385.46	10,975,581	27,704,218.00	739,762.72				1,345,091.95
1934	25,055,174.80	57,866,857	87,728,594.83	2,688,686.54	289,836.99	45,829.56	43,066.91	3,991,570.95
1933	24,662,589.46	56,637,196	91,549,635.62	2,953,780.00	173,563.16	37,314.00	1,643.14	3,648,816.65

INDIAN LANDS

On behalf of the Office of Indian Affairs technical supervision of mineral development was continued in 1934 on tribal and restricted allotted lands within the limits of numerous Indian reservations. Oil and gas supervision involved 4,668 leaseholds, 4,588 wells, and aggregate royalty and rental accruals of $1,817,886.10 for Indian beneficiaries in 7 States and in 27 different tribes, and the drafting of a new form of lease for restricted lands designed to afford the lessor a greater measure of protection and of participation in leasehold revenues than heretofore. Mining supervision involved 40 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of $247,367.48 during the year; 42 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes acreage in Oklahoma, with aggregate production of 388,094 tons of coal and royalty accruals of $25,805.61; 13 agency coal mines in Arizona, Colorado, Montana, New Mexico, North Dakota, and Utah; and special investigations of gold occurrence on land under lease application in the Hoopa Valley Reservation, Calif.

NAVAL PETROLEUM RESERVES

On behalf of the Navy Department, supervision was continued during the year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Reserve No. 3, in Wyoming. Production from the California reserves aggregated 3,720,735.36 barrels of petroleum, 4,328,047,000 cubic feet of natural gas, and 14,440,117 gallons of natural-gas gasoline, having an aggregate royalty value of $682,528.15.

PUBLIC WORKS PROJECTS

Throughout the greater part of the year much of the regular work of the conservation branch was subordinated to related activities undertaken with funds allotted by the Public Works Administration. Under 23 project allotments amounting to $11,764 expenditures of $9,819.13 were made during the year for repairs and physical betterments at the camps maintained for branch employees at Taft, Calif., and Midwest, Wyo. Under 9 project allotments amounting to $200,000 expenditures of $59,256.09 were made for the proper plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands in the West and thereafter improperly abandoned or merely deserted. Under 6 project allotments amounting to $428,200 expenditures of $168,288.53 were made in extinguishing and controlling coal-outcrop fires and in filling, bulkheading, or otherwise safeguarding abandoned mine or prospect openings on publicly owned coal lands in the West and on Indian-owned coal lands and lead and zinc lands in Oklahoma, and in subsurface studies of oil and gas occurrence in Indian-owned lands in Oklahoma. Under 11 project allotments amounting to $250,000 expenditures of $99,155.28 were made for utilization surveys of the power and storage resources of important rivers and creeks in nearly all the public-land States. Except for those involving camp rehabilitation the projects undertaken were planned for continuance during a period of 18 months and completion prior to June 30, 1935. Many of the oil and gas projects involved the letting of contracts under which operations were not begun until after the end of the fiscal year 1934.

SUMMARY OF FIELD OPERATIONS BY STATES

Alabama.—Inspected oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised one coal lease.

Alaska.—Supervised 4 leases, 2 licenses, and 18 prospecting permits for coal and 101 prospecting permits for oil and gas.

Arizona.—Supervised 9 power projects and completed 206 miles of stream-utilization surveys on Williams, Little Colorado, and Verde Rivers. In cooperation with the University of Arizona and the United States Forest Service con-

tinued surveys of the grazing and agricultural resources of the State. Supervised on public land 6 prospecting permits for potassium, 6 prospecting permits for sodium, and 63 prospecting permits for oil and gas; on Indian land, 1 lease for oil and gas.

Arkansas.—Supervised 1 power project. Inspected oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 9 prospecting permits for oil and gas.

California.—Examined the Big Bar coal field, Trinity County, and one tract in Sonoma County for mineral classification. Supervised 44 power projects and completed 310 miles of stream-utilization surveys on Sacramento, McCloud, and Kern Rivers and Putah Creek, including Kennett, Isabella, and Monticello reservoir sites and Kennett, Bakersfield, Democrat Springs, and Isabella dam sites. Continued detailed studies of grazing conditions in Mono Lake and Owens Valleys in cooperation with the city of Los Angeles. Supervised on public land 4 leases and 2 prospecting permits for potassium, 16 prospecting permits for sodium, 3 prospecting permits for coal, 215 leases and 697 prospecting permits for oil and gas; and on naval petroleum reserves 24 leases for oil and gas.

Colorado.—Made structural examination of Mancos Divide gas field, Montezuma County, for mineral classification and leasing-law administration, and geologic surveys of an area of burning coal near Coalmont, Jackson County, precedent to the adoption of measures to extinguish or control the fire. Supervised six power projects and completed 50 miles of stream-utilization surveys on Gunnison, Roaring Fork, and San Juan Rivers, including the Trujillo reservoir site on the San Juan. Supervised on public lands 79 leases, 12 licenses, and 40 prospecting permits for coal, 1 prospecting permit for potassium, and 28 leases and 459 prospecting permits for oil and gas; and on Indian lands 6 leases for oil and gas.

Florida.—Inspected oil and gas prospecting operations throughout the State and examined one tract each in Liberty, Hamilton, and Lee Counties for mineral classification.

Idaho.—Supervised 19 power projects and completed 145 miles of stream-utilization surveys on Snake River, Henrys Fork, and Priest River. Completed reconnaissance studies of grazing capacities and conditions in the proposed Garden Creek and Lemhi Valley grazing districts. Supervised 11 prospecting permits for coal, 2 leases for phosphate, and 77 prospecting permits for oil and gas.

Kansas.—Examined one tract in Riley County for land classification. Supervised 13 prospecting permits for oil and gas.

Louisiana.—Inspected oil and gas prospecting operations throughout the State and examined one tract in Catahoula Parish for mineral classification. Supervised 11 leases and 1 prospecting permit for oil and gas.

Mississippi.—Inspected oil and gas prospecting operations throughout the State and examined two tracts in George County for mineral classification.

Montana.—Supervised three power projects and completed 140 miles of stream-utilization surveys on Kootenai, Flathead, and Blackfoot Rivers. Completed investigation of the grazing resources of the Mizpah-Pumpkin Creek Grazing Reserve. Supervised on public land 90 leases, 22 awarded leases, 66 licenses, and 44 prospecting permits for coal, 5 leases for phosphate rock, and 82 leases and 643 prospecting permits for oil and gas; and on Indian land 1 lead-silver-gold lease and 50 leases for oil and gas.

Nebraska.—Supervised one prospecting permit each for potassium and for oil and gas.

Nevada.—Supervised five power projects and completed 117 miles of stream-utilization surveys on Little Humboldt and Muddy Rivers. Supervised 4 prospecting permits for coal, 1 lease for phosphate, 10 prospecting permits for potas-

sium, 1 lease and 5 prospecting permits for sodium, and 59 prospecting permits for oil and gas.

New Mexico.—In cooperation with the geologic branch completed geologic survey of parts of Sandoval and Rio Arriba Counties for coal classification. Completed 125 miles of stream-utilization surveys on Chama, Gila, and San Francisco Rivers and Rio Grande. Supervised on public land 22 leases and 23 prospecting permits for coal, 9 leases and 158 prospecting permits for potassium, 10 prospecting permits for sodium, 22 prospecting permits for sulphur, and 94 leases and 1,195 prospecting permits for oil and gas; and on Indian land all agency coal mines and 7 leases for oil and gas.

North Dakota.—Supervised 72 leases, 14 authorized leases, 18 licenses, and 1 prospecting permit for coal, and 20 prospecting permits for oil and gas.

Oklahoma.—Supervised on public land 17 leases and 14 prospecting permits for oil and gas; and on Indian land 42 leases, 3 pending leases, 12 prospecting permits, and 6 pending permits for coal, 40 leases for lead and zinc, and 4,563 leases for oil and gas. Bored 103 auger holes and made 207 water analyses in a study of subsurface pollution involving appraised damages of $100,000 to 24 Indian allotments.

Oregon.—Examined one tract in Multnomah County for coal classification. Supervised 37 power projects and completed 51 miles of stream-utilization surveys on the Hood, Willamina, and Umatilla Rivers and Gales and Catherine Creeks, including numerous small reservoir sites. Supervised 1 lease and 7 prospecting permits for coal, 1 lease for oil shale, and 46 prospecting permits for oil and gas.

South Dakota.—Supervised 4 leases, 1 license, and 2 prospecting permits for coal and 26 prospecting permits for oil and gas.

Utah.—Completed detailed geologic survey of Petroleum Reserve No. 7, in Washington County, for mineral classification and leasing-law administration and examined one tract in Iron County, for coal classification. Began a systematic survey of the grazing resources of grazing district no. 4, in the west-central part of the State. Supervised seven power projects and completed 72 miles of stream-utilization surveys on Huntington, Cottonwood, Pleasant, Ephraim, and Manti Creeks. Supervised 37 leases, 2 licenses, and 86 prospecting permits for coal, 3 prospecting permits for sodium, 42 prospecting permits for potassium, and 11 leases and 535 prospecting permits for oil and gas. Supervised on Indian land one lease for oil and gas.

Washington.—Supervised 12 power projects and completed 93 miles of stream-utilization surveys on Nooksack and Toutle Rivers, Clark Fork, and Sheep Creek. Supervised 17 prospecting permits for coal, 1 authorized lease and 1 prospecting permit for sodium, and 8 prospecting permits for oil and gas.

Wisconsin.—Supervised one power project.

Wyoming.—Examined 9 square miles in Natrona County for coal classification and 4 square miles in Goshen County for phosphate classification. Supervised 4 power projects and completed 98 miles of stream-utilization surveys on Bear, Laramie, and Green Rivers. Supervised on public land 44 leases, 21 licenses, and 49 prospecting permits for coal, 2 prospecting permits for sodium, 422 leases and 1,270 prospecting permits for oil and gas; and on Indian land 40 leases for oil and gas. Made 22,970 determinations of oil gravity, 55 analyses of oil, 35 analyses of natural gas, and 295 analyses of oil-field waters.

WORK ON PUBLICATIONS

Texts.—The book publications of the year in the regular series numbered 47, covering 6,602 pages. Besides these publications, 46 brief papers in mimeographed form were issued as memoranda for the

press. During the year 19,007 pages of manuscript were edited and prepared for printing, and 2,234 galley proofs and 7,434 page proofs were read and corrected. Indexes were prepared for 29 publications, covering 5,039 pages. Copy and proof or stencils for 1,297 pages of multigraph and mimeograph matter were read.

Illustrations.—The section of illustrations prepared 2,002 drawings and photographs, transmitted 456 illustrations to accompany 26 reports, received and examined 515 proofs, and examined 32 editions. The work included considerable drafting for the Public Works Administration.

Geologic editing and drafting of maps and illustrations.—The geologic map of Colorado, scale 1:500,000, was prepared for engraving and reached first plate proof of the boundaries. Letter symbols for this map were prepared for engraving, and the explanation was prepared for typesetting. The geologic map of Texas, scale 1:500,000, was prepared for engraving and the explanation prepared for typesetting. The printing of the geologic map of the Valley of Virginia, scale 1:250,000, and of the map showing mineral resources of the Tennessee Basin, scale 1:500,000, was completed. The maps for the Somerset-Windber (Pa.) and Montevallo-Columbiana (Ala.) folios were approved for printing. The geologic maps of the Hollidaysburg-Huntingdon (Pa.) folio reached first plate proof. Illustrations for 16 papers, ready for publication, were edited, and 113 drawings were made for papers by geologists for publication by State geological surveys or other organizations.

Engraving and printing.—During the fiscal year 80 newly engraved topographic maps were printed, including 6 revised maps (of this number 7 were completed under the Public Works allotment), and 8 new State and other maps and 3 special maps were photolithographed and printed, making a total of 91 new maps printed and delivered. Corrections were engraved on the plates of 115 maps. Reprint editions of 150 engraved topographic maps and 7 photolithographed State and other maps were printed and delivered. In addition, 43 new topographic maps had been engraved and were in press June 30, including 18 under Public Works allotment, and the engraving of 6 other new topographic maps was nearly completed, including 2 under Public Works allotment. Of new and reprinted maps, 248 different editions, amounting to 612,115 copies, were delivered.

A large amount of work was done for 58 other units of the Government and 2 State Governments. This work included many reprints, and the charges for it amounted to about $141,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

Of topographic maps, geologic maps, and contract and miscellaneous work of all kinds, a grand total of 2,214,728 copies were printed and delivered.

The output of the photographic laboratory consisted of 8,588 negatives (including 3,763 wet plates for photolithographs, 882 wet plates for photographic prints, 12 paper negatives, 988 dry plates, 328 lantern slides, and 2,615 field negatives developed), 21,044 prints (including 2,699 maps and diagrams, 16,983 photographs for illustrations and records and 1,362 bromide enlargements), 3,154 zinc plates, 282 intaglio etchings, 4 celluloid prints, and 167 prints mounted.

Distribution.—A total of 295 publications, comprising 47 new books and pamphlets, 91 new or revised topographic and other maps, and 157 reprinted topographic and other maps, were received by the division of distribution during the year. A number of special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 102,291 books and pamphlets and 612,115 topographic and other maps, a grand total of 714,406.

The division distributed 142,611 books and pamphlets, 1,575 geologic folios, and 630,741 maps, a grand total of 774,927, of which 1,358 folios and 457,965 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were $35,101.52, including $34,705.33 for topographic and geologic maps and $396.19 for geologic folios. In addition to this $1,621.78 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were $36,723.30.

LIBRARY

A Civil Works Administration project was set up for the library December 18, 1933, and about 50 workers were employed on a rehabilitation program. Much worth-while work in cataloging the Kunz collection on precious stones, inventorying the library, mending more than 3,000 books, etc., was accomplished before the closing up of the Civil Works Administration on April 28, 1934. The inventory showed a count of 186,900 books in the library. Since June 1, 1934, this special work has been continued under the Emergency Relief Administration. The accessions during the year comprised 9,366 books, pamphlets, and periodicals and 755 maps. The library was used by 11,182 readers, nearly half of them not members of the Survey, and the loans for use outside of the library numbered 13,910. Work on the bibliography of North American geology was continued. The library facilities are being used in preparing a bibliography of foreign geology for the Geological Society of America and an annotated bibliography of economic geology for the National Research Council.

Funds available, expenditures, and obligations incurred by Geological Survey, fiscal year ended June 30, 1934

	Funds available				Obligations			Balance
	Amounts appropriated or transferred	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities	Total	
		Made	To be made					
APPROPRIATIONS								
Salaries	$125,000.00	----------	$12,121.02	$137,121.02	$112,821.56	$23,433.02	$136,254.58	$866.44
Topographic surveys	450,000.00	$161,692.28	65,272.31	676,964.59	568,161.68	28,288.95	596,450.63	[1] 80,513.96
Geologic surveys	300,000.00	15,161.46	25,636.91	340,798.37	310,659.70	23,732.31	334,392.01	6,406.36
Volcanologic surveys	12,500.00	----------	----------	12,500.00	5,684.76	1,864.09	7,548.85	4,951.15
Alaskan mineral resources	30,000.00	4,815.19	1,482.70	36,297.89	30,540.99	2,339.76	32,880.75	3,417.14
Gaging streams	540,000.00	232,371.25	199,830.87	972,202.12	781,278.41	26,344.86	807,623.27	[2] 164,578.85
Classification of lands	100,000.00	2,346.13	7,768.57	110,114.70	99,403.69	6,169.33	105,573.02	4,541.68
Printing and binding	110,000.00	912.54	----------	110,912.54	19,727.30	56,185.24	75,912.54	[3] 35,000.00
Preparation of illustrations	15,000.00	1,837.10	----------	16,837.10	16,590.12	59.26	16,649.38	187.72
Geologic and topographic maps	85,000.00	116,786.68	28,560.52	230,347.20	207,986.18	11,476.75	219,462.93	10,884.27
Mineral leasing	225,000.00	17,605.67	15,629.46	258,235.13	210,174.39	13,121.08	223,295.47	34,939.66
	[4] [5] 1,992,500.00	553,528.30	356,302.36	2,902,330.66	2,363,028.78	193,014.65	2,556,043.43	346,287.23
TRANSFERS								
Federal Power Commission (act Feb. 17, 1933), 1934	700.00	----------	----------	700.00	104.92	11.39	116.31	583.69
Flood control, Mississippi River and tributaries (War Department, act Feb. 14, 1931)	[6] 1,310.30	146.43	----------	1,456.73	587.58	869.15	1,456.73	0
Irrigation, Indian reservations (reimbursable; act Feb. 17, 1933), 1934	800.00	----------	----------	800.00	479.69	280.01	759.70	40.30
Irrigation, San Carlos and Florence-Casa Grande projects, Arizona (reimbursable; act Feb. 17, 1933), 1934	2,750.00	----------	----------	2,750.00	1,894.37	823.46	2,717.83	32.17
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 14, 1931)	[6] 478.57	11.15	----------	489.72	471.83	17.89	489.72	0
Maintenance and improvement of existing river and harbor works (War Department, act Apr. 22, 1932)	[6] 4,093.50	349.40	----------	4,442.90	4,442.90	----------	4,442.90	0
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 17, 1933)	21,034.00	10.25	208.24	21,252.49	15,679.96	4,104.56	19,784.52	[7] 1,467.97
National industrial recovery, Interior Department, Geological Survey, 1933-35	4,497,164.00	17,269.82	15,510.45	4,529,944.27	2,015,434.87	217,535.04	2,232,969.91	[7] 2,296,974.36
Operating and care of canals and other works of navigation (War Department, act Feb. 17, 1933)	2,800.00	----------	----------	2,800.00	1,344.17	1,069.06	2,413.23	[7] 386.77
Operation and conservation of naval petroleum reserves (Navy Department, act Feb. 17, 1933), 1934	37,582.00	1,790.34	325.58	39,697.92	38,363.78	899.96	39,263.74	434.18
Supervising mining operations on leased Indian lands (act Feb. 17, 1933), 1934	56,800.00	2,664.21	1,743.05	61,207.26	59,339.16	1,868.10	61,207.26	0

Funds available, expenditures, and obligations incurred by Geological Survey, fiscal year ended June 30, 1934—Continued

	Funds available				Obligations			Balance
	Amounts appropriated or transferred	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities	Total	
		Made	To be made					
TRANSFERS—continued								
Wapato Irrigation and Drainage District, Washington (reimbursable; act Feb. 17, 1933), 1934	$575.00			$575.00	$239.70	$313.35	$553.05	$21.95
Waterways treaty, United States and Great Britain (State Department, act Mar. 1, 1933), 1934	48,200.00	$52.77	$122.50	48,375.27	35,390.83	11,160.34	46,551.17	1,824.10
Working fund, Department of the Interior, Civil Works	146,150.00			146,150.00	130,865.56	7,740.38	138,605.94	7,544.06
Working fund, Department of the Interior, Public Works (Agriculture, Public Roads)	75,000.00	628.08	833.19	76,461.27	33,282.74	301.29	33,584.03	[7] 42,877.24
Working fund, Department of the Interior, Public Works (Agriculture, Weather Bureau)	46,900.00		73.50	46,973.50	19,079.64	5,357.39	24,437.03	[7] 22,536.47
Working fund, Department of the Interior, Public Works (Army Engineers)	11,900.00			11,900.00	4,240.04	5,039.73	9,279.77	[7] 2,620.23
Working fund, Department of the Interior (General Land Office)	11,900.00			11,900.00		7,675.00	7,675.00	[7] 4,225.00
Working fund, Department of the Interior, Public Works (Mississippi Valley Committee)	8,000.00			8,000.00	4,754.90	1,331.48	6,086.38	[7] 1,913.62
Working fund, Department of the Interior, Public Works (Bureau of Reclamation)	10,000.00		222.50	10,222.50	8,171.61	1,157.02	9,328.63	[7] 893.87
Working fund, Department of the Interior, Public Works (advance for water-resources branch supplies and materials)	5,000.00			5,000.00	612.50	2,797.50	3,410.00	[7] 1,590.00
Working fund, Department of the Interior (Tennessee Valley Authority)	170,140.00	4.59	6,199.34	176,343.93	125,093.05	47,703.66	172,796.71	[7] 3,547.22
Total	5,159,277.37	22,927.04	25,238.35	5,207,442.76	2,499,873.80	318,055.76	2,817,929.56	2,389,513.20
Grand total	7,151,777.37	[8] 576,455.34	[8] 381,540.71	[8] 8,109,773.42	[8] 4,862,902.58	[8] 511,070.41	[8] 5,373,972.99	2,735,800.43

[1] $50,000 of this balance continued available for expenditure during the fiscal year 1935.
[2] $163,000 of this balance continued available for expenditure during the fiscal year 1935.
[3] This balance continued available for expenditure during the fiscal year 1935.
[4] In addition to these appropriations, there was an allotment of $9,345.80 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.
[5] Expenditure of these appropriations was restricted by the Bureau of the Budget, which imposed a "cash withdrawal limitation" of $1,496,212 during the fiscal year.
[6] Balance unobligated June 30, 1933, and continued available for expenditure in the fiscal year 1934.
[7] Balance unobligated June 30, 1934, and continued available for expenditure in the fiscal year 1935.
[8] Included in these amounts is $454,340.52 covering work performed by Geological Survey units for other Geological Survey units; supplies furnished by one branch to another; credits to appropriations on account of impounded salaries which have been released; adjustment vouchers between transferred funds and Geological Survey appropriations; and other adjustments necessarily reported in combining totals but otherwise a duplication.

Classification of obligations incurred by the United States Geological Survey during the fiscal year ended June 30, 1934

	Salaries	Topographic surveys	Geologic surveys	Volcanologic surveys	Alaskan mineral resources	Gaging streams	Classification of lands
Personal services	$106,968	$1,161,136	$356,866	$5,725	$23,048	$809,272	$85,682
Supplies and materials		20,190	5,169	115	153	99,780	203
Storage of motor cars		901	397			415	43
Communication service		1,497	239	2	19	4,280	84
Travel expenses		301,794	38,713	8	5,919	117,778	4,911
Transportation of things		67,025	6,380	34	205	27,973	429
Printing, binding, photographing, etc		67,209	3,467		348	4,579	146
Heat, light, power, water, and electricity		272	143		81	409	
Rents		373		1		5,922	
Repairs and alterations		9,452	860	102	146	41,324	57
Special and miscellaneous current expenses		387	194			1,711	21
Equipment		163,794	7,692		69	111,324	111
Structures				627		76,705	
Impoundments of compensation deductions and vacancy savings	29,287	75,614	34,787	2,135	2,652	28,543	10,176
Miscellaneous transfers and adjustments		139,593	10,889		241	234,000	3,728
Total	136,255	2,009,237	465,796	8,749	32,881	1,564,015	105,591

	Printing and binding	Preparation of illustrations	Geologic and topographic maps	Mineral leasing	Civil Works projects	Total
Personal services		$15,109	$175,465	$432,942	$51,274	$3,223,487
Supplies and materials		512	26,918	11,770	4,387	169,197
Storage of motor cars				111		1,867
Communication service			2	2,578	272	8,973
Travel expenses			102	29,762	30,256	529,243
Transportation of things			41	2,534	1,523	106,144
Printing, binding, photographing, etc	$75,043	266	7,798	378	26,093	185,327
Heat, light, power, water, and electricity				4,092		4,997
Rents				1,076	247	7,619
Repairs and alterations			396	38,384	281	91,002
Special and miscellaneous current expenses				557	128	2,998
Equipment		28	3,425	8,710	24,145	319,298
Structures				11,673		89,005
Impoundments of compensation deductions and vacancy savings		692	12,691	16,495		213,072
Miscellaneous transfers and adjustments	870	42	300	32,081		421,744
Total	75,913	16,649	227,138	593,143	138,606	5,373,973

NOTE.—In addition to the above amounts, there was expended directly by cooperating agencies $72,242 for topographic surveys and $244,547 for stream gaging.

OFFICE OF EDUCATION

(Bess Goodykoontz, Acting Commissioner)

I. GENERAL STATEMENT

1. CHANGES IN THE ADMINISTRATIVE ORGANIZATION

THE COMMISSIONERSHIP

In May of this year Commissioner of Education George F. Zook resigned to become Director of the American Council on Education, his resignation to become effective on June 30. At the same time announcement was made of the appointment to the commissionership of John Ward Studebaker, superintendent of schools of Des Moines, Iowa, who will take office September 1.

The year of Dr. Zook's incumbency of the commissionership was a particularly important one for education and educational agencies. The effects of the depression were still weighing heavily on the schools, and the problems of adjustment were critical. The relation of education to the whole program of economic recovery was stated by Dr. Zook in this way:

> Today, from the President to the humblest citizen there is a common agreement that education, widespread and up to date, holds the key to our national problems. On education depends all of our progress in the development of the production and distribution of material goods. To education we must look for vision and balance in our social life. In other words, our provision for education, in its broadest sense, is the greatest assurance to the American people of an opportunity for an abundant life.

Because of the close connection of education to the activities of many of the Government agencies engaged in phases of the recovery program, Commissioner Zook attempted to cooperate in every possible way with such Government programs. Illustrations of this include the Public Works Administration in its school-building activities, the N.R.A. in whatever codes affect the schools, and the C.C.C. in the educational programs in the camps. Descriptions of these cooperative activities as well as accounts of the continued research and service program of the office are given on the following pages.

UNION OF TWO FEDERAL EDUCATION AGENCIES

In October 1933 the duties and functions of the Federal Board for Vocational Education, which was created as a separate organization in 1917, were transferred to the Office of Education under the Commis-

sioner of Education, and the officers and employees of the Board became an integral part of the Office of Education. The Secretary's order effective October 10 carried out the terms of President Roosevelt's Executive order of June 10, which specified that "the functions of the Federal Board for Vocational Education are transferred to the Department of the Interior, and the Board shall act in an advisory capacity without compensation."

In announcing the transfer of the functions of the Federal Board for Vocational Education, Secretary Ickes said:

> This transfer of the functions of the Board is not to be interpreted as any curtailment of the activities of the Federal Government in the field of vocational education. Both Dr. George F. Zook, the Commissioner of Education, and I have long been deeply interested in vocational education studies and efforts, and we both propose to promote the development of this highly important part of the field of education vigorously.

Emphasizing the importance of service to local school officers in the conduct of their total education program, the Commissioner, in accepting the new responsibilities, said:

> I wish to assure you that I have a deep sense of the importance of this added responsibility. I will, to the best of my ability, promote the cause of vocational education vigorously and wisely. I trust that this union of educational forces in the Federal Government will increase the effectiveness of the service which the Federal Government renders to the States and local communities in the conduct of their educational programs.

Upon the transfer of vocational education functions to the Office of Education the staff of the Board became a separate division within the Office of Education under the immediate supervision of the former director of the Board, who was appointed Assistant Commissioner for Vocational Education. The rest of the Office, which was the former Office of Education, continues under the direction of the Assistant Commissioner of Education. Shortly after this combination was ordered the work in connection with mails and files, supplies, equipment, personnel, and accounting of the two formerly separate organizations was combined in the administration division under the general direction of the chief clerk and the work in connection with publications was combined in the editorial division of the Office of Education. No other changes in organization have been made up to the present time.

2. IMPORTANT EDUCATION PROBLEMS OF THE YEAR

CURTAILMENT OF EDUCATIONAL OPPORTUNITIES

In communities of 5,000 and under the opportunities for attendance in elementary schools returned, in most school districts, to near normal. This was made possible through financial aid from Federal sources. The restoration was not fully brought about, however, until

the second semester as, in the first half of the year, aid was extended only to communities of 2,500 and under. Even so, in some States there was not full opportunity for many children recently emancipated from labor, for the Federal grants permitted no increase in teachers nor in number of pupils enrolled.

In larger cities few if any schools were closed for the year but in many cases a month or more was lopped from the school term. To meet the financial situation a host of teachers worked at reduced and often greatly reduced pay. In many communities funds were raised by private subscription or a tuition was charged for those who could pay. The citizens were determined that the schools should be kept open as far as possible and the teachers did their share, and more, to meet the situation.

Even where there has been no limitation of opportunity to attend school it should not be overlooked that in a certain percentage of schools there has occurred a loss of some privileges in that certain activities pertaining to general culture and the use of leisure, such as art and music, have been dropped from the curriculum. It would seem as if, at the present day, these activities deserved to be stressed even more than formerly and it is to be hoped that local boards will take second thought as to their importance in modern life. In some instances the health service of the school has been crippled or abandoned, which is hardly in accordance with the principle that health is the first objective of education.

In the realm of higher education the opportunities for schooling were, in most instances, available although many colleges and universities have labored under financial difficulties. The problem with students and their parents was that of meeting tuition fees and living expenses. Present conditions have, of course, greatly reduced the opportunity for self-help through student employment and many ambitious young people who would gladly have earned their way found that way doubly barred. The attempt to meet this situation by Federal funds, to be used in furnishing suitable types of work for needy students, has been of help, but it is not an altogether simple matter to arrange for such employment. The situation of the seeker after higher learning is by no means wholly relieved although thousands of worthy students have thus been enabled to pursue their studies.

YOUTH PROBLEMS

During this present period of unemployment, the opportunities for youth to obtain work are meager to a degree not experienced in previous periods of economic depression. The codes of fair competition operate properly to give jobs to adults. Continuation schools have largely ceased to exist. Apprenticeship opportunities are meager indeed.

Two and a quarter million young people reach the age of employability each year. Since October 1929, more than 10 million have reached the employable age. Other millions below 21 years when the depression began are now between 22 and 26. From these 16 million young people, 18 to 25 years of age, are recruited the increasing army of transients, the pathetic idlers loafing on the street corners of every village and city in the country, and the startlingly long list of names on the rosters of our penal institutions. It seems imperative that something more comprehensive than the Civilian Conservation Corps should be worked into the national recovery machinery of government for these millions of young people.

In April 1934, a preliminary conference with representatives of the various governmental agencies carrying on some activities in the interest of youth was called by the Commissioner of Education. With the unanimous approval of these representatives and with the aid of funds provided for that and similar purposes by the General Education Board of New York, a larger conference of about 70 people was called by the Commissioner on June 1 and 2. At this conference persons from all sections of the country interested in (a) employment, (b) education and guidance, and (c) leisure-time activities worked out a statement of basic principles which should guide the development of a program for youth.

They also outlined the activities which were thought to be essential for such a program. They furthermore recommended that, in close relation with the Office of Education, a commission should be set up to study the questions further, and to do what it could to carry out a suitable program in the interest of youth.

The Commissioner of Education subsequently appointed three members of the staff of the Office of Education as a continuing committee on out-of-school youth.

FINANCING EDUCATION

During 1933–34 education was struggling under a most distressing financial load. While the numbers of children and youth demanding education continued to increase rapidly; while this increase came at the most expensive levels, namely, in the high schools and post-high-school courses; and while the unemployment among both parents and youth added to the variety and urgency of the demands for education, the budgets for education were severely cut. Not only was the building of schoolhouses almost completely stopped, but other items, intimately associated with the service of education, were severely curtailed. Needed school books were not bought, teachers of many subjects which are mistakenly regarded by some boards of education as nonessential, were dismissed, other teachers were dismissed, thus necessitating larger numbers of children per room, teachers' salaries

were disproportionately reduced in many places, and finally to come within the reduced budgets, school terms were shortened or teachers kept schools open without pay.

In such a critical situation the Office of Education has naturally been deeply concerned. It has sought in every way possible to cooperate in checking the tendency to cut educational budgets unduly, and to find sources of financial aid. Cooperating with the American Council on Education, it aided in the Conference on the Crisis in Education called by President Hoover in January 1933. As a result of this conference a movement was set on foot to establish in many communities of the country Citizens Councils on Constructive Economy. These are proving effective bulwarks against unreasonable slashing of school budgets.

In August 1933, the Commissioner of Education called a conference to canvass the question of how the Federal Emergency Relief Administration might incorporate into its work-relief program measures that would aid education. Representatives of education at all levels as well as representatives of the Federal Emergency Relief Administration participated. Out of that conference grew the proposals which resulted in the creation of the Education Division of the Federal Emergency Relief Administration, through which has been administered the relief work for rural schools, nursery schools, adult education both vocational and general, and for college students.

It was recognized, however, that the financial needs of schools and colleges could not be met most effectively from funds appropriated for relief. Therefore, it was desired to have the Congress give thorough consideration to the needs of education. Accordingly, the Commissioner of Education took the initiative in developing a program of Federal legislation for the financial aid of education. In November 1933, a small group of leaders was called together by the Commissioner. This group called a conference after three meetings, adopted a legislative program, and appointed a special committee to do what might be done to aid in the passage of the proposed legislation.

While the bills sponsored by this large conference were not passed by the Congress, it is believed that significant progress was made toward a better understanding and a more sympathetic attitude by members of the Congress with respect to the problems involved.

EDUCATION PROGRAMS FOR THE UNEMPLOYED

During the past year the condition of widespread unemployment has presented difficult problems in the field of education, more particularly in the field of vocational education.

It may be noted that the mandate under which the Federal Office of Education and the cooperating State vocational education staffs administer vocational education funds is, in the phraseology of the

Federal act, a mandate to safeguard the use of such funds under public supervision and control, so as to insure that they shall be used to fit workers for and keep them fit for useful employment in industry, agriculture, and the home. The theory underlying this statutory mandate is that only workers fit for employment can be employed under any conditions and that labor should not be permitted to continue unemployed in any period—either of normal activity or depression or of recovery—for the reason that training has not been made available to render displaced unemployed workers fit for employment in such jobs as become available.

Employers and employment agencies have found that even during the period of extreme depression and in larger measure as we have entered upon recovery in different lines of economic activity the unemployed worker has in thousands of instances not received the training required to render him fit for employment in any available job. To the extent that it can be attributed to the failure of the community, to provide the training needed to qualify workers for employment under the rapidly changing conditions of work unemployment must be recognized as being a responsibility of vocational education. Provision of adequate vocational training, furthermore, is a condition of recovery itself, since neither industry nor agriculture can resume normal operations with a man power untrained in the new technics of production and service.

Federal and State vocational staffs have during the past year realized this responsibility for rendering labor fit for employment, and assisted local communities to modify their vocational programs accordingly. Relief of unemployment has in fact been a dominant interest in vocational education during the year.

Services rendered under the cooperative efforts of Federal and State vocational staffs have included an extensive survey of changing conditions in industry, agriculture, and the home, to determine specific needs for training, and the modification of vocational programs required to meet these needs in keeping labor fit for employment; analysis of the vocational training needs of, and organization of training programs for, youths assembled in Civilian Conservation Corps camps; development of suitable courses in public schools for youths in the ages of 14 to 16 years who are not any longer permitted under State laws and National Recovery Administration codes to enter into or continue in regular employment, and who must therefore be either in school or completely unemployed; the development of vocational training adapted to the needs of farmers operating under the agricultural adjustment programs for the rehabilitation of agriculture and improvement of the employment situation in that broad field; development of subsistence homestead farming programs; survey of handicraft occupations, and of training needs for such occupations, as available

resources for unemployed workers under certain conditions; formulation of live-at-home programs for those with part-time employment; survey of training needs of individuals and families returning to farms from industrial centers where unemployment has prevailed, to adjust such individuals and families to employment conditions in the rural community; development of home-making programs adapted to the needs of individuals and families on relief, or with incomes reduced by unemployment, and generally of home-making programs for safeguarding the welfare of the family under conditions imposed by unemployment and diminished family incomes; conduct of surveys to determine the number and training needs of unemployed disabled persons, and of employment opportunities available for such persons; expansion of services being rendered for the vocational rehabilitation and return to remunerative employment of unemployed physically handicapped persons; and development of cooperative working relations between State employment offices and vocational rehabilitation departments, under section 7 of the Wagner-Peyser Act passed during the year to promote a national system of employment offices.

While many of these services have during the past year taken on the aspect of emergency services, and have involved extensive cooperation with emergency agencies organized specifically for dealing with the prevailing unemployment situation, they are not essentially new in character. On the contrary they are all of them implied as required to be rendered under our established national programs for cooperation with the States in the promotion of vocational education and rehabilitation.

3. COOPERATION WITH EMERGENCY AGENCIES

FEDERAL EMERGENCY RELIEF ADMINISTRATION

Shortly after the creation of the national relief program, offers of cooperation were made of all facilities of the Office of Education with reference to the fields of general education, vocational education, and rehabilitation in order to assist in developing a Nation-wide program of work relief for professional people qualified to teach in developing various educational projects. Preliminary conferences were held from time to time to discuss the matter and the Commissioner called a meeting of State superintendents to discuss possibilities.

Arising out of these preliminary contacts a representative of the Office of Education was officially designated as liaison officer representing general education and adult education, while another member of the Office was designated as liaison officer to represent vocational education and rehabilitation. These two staff members, together with the Commissioner, worked in formulating several authorizations creating work relief in various educational projects and then developed

outlines for State plans to take advantage of these authorizations. When, later, an educational division was set up, the two liaison officers were lent for full-time service.

It became evident that an authorization should be formulated to take care of children of preschool age from unemployed underprivileged families. The services of a specialist in nursery-school education were accordingly lent to the relief organization to organize this work and this developed into a full-time loan through the fall and winter for the administration of this special activity.

In order to stimulate the use of the relief program in providing a proper proportion of the emergency educational services to take care of the special needs of the colored race, a specialist in Negro education was loaned to the Relief Administration and he has spent part of his time ever since on this activity.

The critical condition in the rural schools of many of the States indicated that a special relief program would be needed. To determine which financially destitute rural school districts would be eligible to receive the benefits of the new authorization, the services of the statistical staff of the Office of Education were made available. Members of that staff and three experts supplied by the General Education Board were sent to the State departments of education to work with them and the State relief offices in devising individual State forms to secure the desired information and pass upon the claims of various rural school districts.

Committees representing various college associations conferred with the specialists in higher education of the Office and with Relief Administration officials to consider the problem of developing a program of part-time jobs for needy college students who would otherwise be unable to continue their work in school or enter college the second semester. Growing out of these conferences authorization was made providing for 100,000 such part-time jobs open to all colleges and universities organized on a nonprofit basis. A statement of the fundamental conditions providing for participation by the institutions was accordingly formulated with the aid of representatives from the Office of Education and this program went into active effect at once.

To assist in the development of certain specialized forms of education in ways which could not be financed by the State departments of education or the relief funds made available, the Commissioner took an active part in securing special grants from the General Education Board which greatly aided the development of the nursery school program, parent education, and workers' education in the various States. Both the Commissioner and the Assistant Commissioner have actively participated throughout the year in serving on national

advisory committees, notably in the field of nursery school and parent education to assist in the furtherance of these programs.

A meeting, open to representatives from the States engaged in the emergency educational program, was held in connection with the annual program of the American Association for Adult Education and separate programs in these States were participated in by a number of the members of the staff of the Office of Education.

As a result of the serious situation arising in certain sections of the country this summer in the drought areas, the Federal Relief Administration officially requested the Office of Education for assistance in making a study of the special educational needs in the drought areas and two staff members have been officially assigned up to the present time to assist in making this study.

NATIONAL RECOVERY ADMINISTRATION

Members of the staff of the Office of Education have devoted much time during the year to conferences with representatives of the National Recovery Administration, the Agricultural Adjustment Administration, and other recovery agencies.

These conferences have taken up certain aspects of the recovery measures which have an educational significance. The home economics education service of the Office, for example, has cooperated with the States in furthering the recovery program by distributing such literature as has been made available at National Recovery Administration and Agricultural Adjustment Administration headquarters, dealing with problems confronting homemakers in safeguarding the interests of consumers. The service planned a conference on consumer education to develop ways and means of increasing the effectiveness of such education in school programs at all educational levels. The service has cooperated with State staffs also through regional and other conferences, and by correspondence, in making materials on consumer education available to teachers, and in aiding teachers of home economics to initiate instruction along these lines in their teaching programs. Similar cooperation has been effected through the Agricultural Education Service of the Office with the Agricultural Adjustment Administration in adapting vocational agriculture programs to emergency conditions.

One development of cooperation with the National Recovery Administration deserves special mention. During the year industrial occupations have been very generally brought under "codes of fair competition." Under these codes many important questions have arisen regarding apprentice training, as well as training of adult workers. An analysis was made in the trade and industrial service of the Office of Education of all codes approved over a period of 6 months. The volume of this material may be inferred from the fact

that as published in printed or mimeographed form it occupies some 6 feet of shelf room. The objective in making this analysis was to determine what provisions had been incorporated in the codes for apprenticeship and other forms of training. As a result of the analysis and of conferences with representatives of the National Recovery Administration, a Federal committee on apprentice training has been established by the Secretary of Labor, under an Executive order of the President to advise the Secretary and perform such other functions as the Secretary may direct. This order defines an apprentice to mean "a person of at least 16 years of age who has entered into a written contract with an employer or an association of employers which provides for at least 2,000 hours of reasonably continuous employment for such person and his participation in an approved program of training as hereinabove provided." The committee as established under this order comprises 1 representative and 1 alternate from the Division of Vocational Education of the Office of Education, 1 from the Department of Labor, and 1 from the National Recovery Administration.

This formal recognition of the need for organized apprentice training is consistent with, and a long step forward in the direction of more effective realization of the policies of the National Vocational Education Act of 1917, which specifically provides for cooperation with the States in the promotion of such training.

The Office of Education cooperated with the National Recovery Administration in its study of the application of codes of fair competition to privately controlled colleges and universities. As a result of the study, the National Recovery Administration ruled that the Educational activities of privately controlled, non-profit-making colleges should be exempt from the operation of codes if their public service nature was attested by the exemption of their educational property from taxation under the provisions of their charters. Since the code for the textbook publishing industry was intimately related to school costs members of the staff advised with the Administration relative to fair practices in the production and distribution of textbooks.

THE CIVILIAN CONSERVATION CORPS EDUCATIONAL PROGRAM

The plan for an educational program in the Civilian Conservation Corps as approved by President Roosevelt December 7, 1933, was the joint product of Dr. George F. Zook, United States Commissioner of Education, Mr. Robert Fechner, Director of Emergency Conservation Work, and Gen. Douglas MacArthur, Chief of Staff, War Department.

In the conduct of this program the Office of Education acts in an advisory capacity to the War Department. It is charged with the selection and appointment of the educational staff, and it recom-

mends to the Secretary of War the outlines of instruction, teaching material, and types of teaching procedure for use in the camps.

The original plan provided for an Educational Director, working under the guidance of the Commissioner of Education, a corps area educational adviser at each of the nine Army corps area headquarters, a camp educational adviser in each of the 1,468 camps, and an enrollee in each camp chosen as an assistant leader to help the camp educational adviser.

Unfortunately, the budget of the educational program for the 12-month period, April 1, 1934, to March 31, 1935, when finally approved did not carry sufficient money to provide an educational adviser in each camp. Consequently a total of 1,087 educational advisers are now serving the 1,468 camps.

As of the date of this report, the Civilian Conservation Corps educational program stands at full strength in administrative and teaching staff about as follows:

Washington and corps area administrative staff	12
Camp educational advisers	1,087
Assistant camp leaders	1,468
Total full-time educational staff	2,567
Additional part-time teaching staff (estimate)	5,000
Total administrative and teaching staff (estimate)	7,567

As an educational staff operating in one particular type of educational enterprise, this is one of the largest in the world.

For two reasons it is difficult to determine the actual number of enrollees who are participating in the camp educational programs: (1) The large migration of camps in the late spring greatly disturbed the schedules, and (2) the large turnover of enrollees both in April and July made statistics of class attendance practically useless.

In one way or another the presence of an educational staff in camp, and the operation of an educational program, together with the sanction and fostering of educational interests by the Army and Forestry and Parks staffs are not without benefit to every Civilian Conservation Corps enrollee.

The more formal educational interests of enrollees, i.e., interests which are expressed through enrollment in classes or groups for sustained study, fall into these several fields:

(1) *Vocational subjects.*—Enrollees because of their economic plight are mostly interested in better preparation for lines of work which they have followed or for new lines of work.

(2) *Fundamental subjects.*—Probably half of the enrollees have not gone beyond elementary school and a considerable proportion of that half did not complete elementary school; many had no schooling, and others who had a few years of schooling are functionally illiterate.

(3) *Academic subjects.*—This group includes those subjects common to the high school or college curriculum, such as English, history civics, etc.

(4) *Self-expression subjects.*—Dramatics, glee club, debate, spelling bees, hobby crafts, etc.

The handbook for Civilian Conservation Corps educational advisers, prepared by members of the staff of the Office of Education and issued by the Secretary of War, contains the following statement of aims of the Civilian Conservation Corps educational program:

(1) To develop in each man his powers of self-expression, self-entertainment, and self-culture.

(2) To develop pride and satisfaction in cooperative endeavor.

(3) To develop as far as practicable an understanding of the prevailing social and economic conditions, to the end that each man may cooperate intelligently in improving these conditions.

(4) To preserve and strengthen good habits of health and of mental development.

(5) By such vocational training as is feasible, but particularly by vocational counseling and adjustment activities, to assist each man better to meet his employment problems when he leaves camp.

(6) To develop an appreciation of nature and of country life.

Participation of enrollees in the educational program is voluntary, not mandatory. Classes and discussion groups meet in the evenings and at other times that do not conflict with the regular working hours on forestry projects and other work projects.

There is abundant evidence that intelligent and imaginative educational advisers are conducting educational programs under camp conditions with beneficial results to many thousands of enrollees.

PUBLIC WORKS ADMINISTRATION

The National Recovery Act specifies preferences which must obtain with respect to those given jobs on public works projects. One such preference relates to place of residence, the first preference being given to the residents of the county where the project is located. Strictly interpreted, this provision of the law would prevent college students from working on public works projects unless the students lived in the county where the projects are located. The so-called "cooperative colleges" which depend upon getting educationally significant jobs for their students as a part of the regular curriculum requirements, found this residence provision a very serious obstacle to their work. Only such students as lived in the county where the college was located could be placed on jobs in that county. When the matter was brought to the attention of the Public Works Administration by the Office of Education, a ruling of far-reaching importance was obtained. It was held, in effect, that for purposes of the National Recovery Act, a student is a resident

of the county where the institution is located which he is attending. Furthermore, that if the curriculum calls for work on a project in a county other than the one where the institution is located, that other county becomes the seat of the institution for the students assigned to that project. Hence, the students so assigned are residents of the county where the project is located. The residence preference difficulty was thus overcome in the case of students in cooperative colleges. This ruling made possible the continuation of cooperative colleges of engineering through this period, when about the only engineering activities are those connected with Public Works projects.

When funds were made available for school building and repair the Office furnished all State, city, and county superintendents, and all presidents of State colleges and universities full information on the subject and offered its services in expediting the consideration of applications for school-building projects. By February 1934, grants and loans had been made to schools in 116 cities and 17 counties in 41 States, and by the end of the fiscal year, a total of over $100,000,000 had been allotted to schools and colleges.

FEDERAL EMERGENCY RELIEF ADMINISTRATION RESEARCH

The Office of Education approved and sponsored research projects in three universities, Columbia, New York University, and Chicago. The research workers were paid from emergency relief funds. A total of more than 1,700 workers were employed for periods ranging from a few weeks to more than 6 months. The experience with these projects revealed how effective universities are as agencies to give work relief to needy persons of highly specialized training.

II. OFFICE OF EDUCATION

1. RESEARCH AND INVESTIGATION

EDUCATION DURING THE DEPRESSION

There has been a large demand from various sources for information concerning the effects of the depression on the schools and much time has been spent by the Office in collecting data to meet these requests.

In a circular on City Schools and the Economic Situation we furnished information concerning comparative expenditures and budgets for 1933–34 and for recent years, the changes in enrollment and in teaching force, and changes in special services and special classes.

In the Economic Outlook in Higher Education we presented data on the reduction of teaching staff and changes in salary, the trend

of indebtedness of these institutions, and the present income and expenditures as compared with other years.

Material in these studies and other data available were combined and presented in popular form in The Deepening Crisis in Education.

SCHOOL ADMINISTRATION PROBLEMS

How to economize in school expenditures is a question that for the past few years has been confronting school administrators. In order to indicate how this problem may be solved in part, the Office of Education has prepared a series of publications on possible economies in school administration. In all, 11 numbers of the series have been issued, several of which were prepared in 1932–33 and reported for that year. Those not reported that year and completed this year are:

(1) Economies Through the Elimination of Very Small Schools Bull., 1934, no. 3. This study was prepared (a) to present data showing how prevalent and wide-spread the small-school problem really is; (b) to examine concrete evidence of the cost of extremely small schools; (c) to cite ways and means employed both in this country and abroad in reaching a solution to the problem.

(2) Economies in Class and School Organization (Cir. No. 113). This study presents procedures which have to do with the organization of classes and schools and with the distribution of pupils in the elementary school grades.

(3) Techniques for Teaching Large Classes (Cir. No. 114) which summarizes some of the studies on class size and the methods employed in a number of school systems in teaching large classes.

(4) High School Instruction by Mail (Bull., 1933, No. 13). This study shows that by means of correspondence courses inordinately small secondary school classes may be eliminated, that the offerings in small high schools may be increased, and that such courses provide a means of education for children unable to attend school because of distance or some physical handicap, and also for adults.

(5) Operation and Maintenance of the School Plant (Cir. No. 115) which shows how savings and economies have been effected in many school districts by looking after details in the matter of operating and maintaining the school plant.

(6) Economies Through Budgeting and Accounting (Cir. No. 116) which cites examples and uses relevant excerpts on procedures in budgeting and accounting.

(7) A Selected and Annotated Bibliography on Economies (Cir. No. 118) which aims to furnish to school officials a selected list of materials dealing with the administration of schools during the depression.

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The financial aspects of the consolidation of schools and of the transportation of pupils is a problem in which much interest was manifest. As a result of a conference on the subject called by the Office of Education, Circular No. 117, Financial Implications of the Consolidation of Schools and the Transportation of Pupils, was prepared. This report includes data showing what economies may be effected by consolidating schools and school districts.

A study was made to show to what extent school support in the cities of the country has decreased and what some of the effects of such decrease has been (Cir. No. 124). Another study was made which summarizes the condition of the public schools in the States in 1932–33 and the prospects for 1933–34 (Cir. No. 119).

Studies in progress nearing completion are Compulsory School Attendance Laws and their Administration and State Provisions for Equalizing Educational Costs.

EDUCATIONAL LEGISLATION

The paramount educational legislation problem during the year consisted in replenishing insufficient school funds. Facing grim realities, there was a general realization on the part of legislators that many traditional local school systems had outlived their usefulness; and in a few States legislators disclosed a willingness to follow the theory that education is a State function to its logical conclusion. Since the founding of statehood both legal and educational theories have regarded education as a State function, but the proposition that the State should assume a sizable or major amount of the financial responsibilities for the support of public education has been a slow legislative development. The economic depression has given profound impetus to this movement.

By reason of the deep concern over the financial difficulties of education correspondence concerning school legislation was greatly increased and the services rendered considerably extended. During the fiscal year the Office continued its policy of issuing circulars on current legislative action affecting education and three such circulars were issued, each entitled "Legislative Action in 1933 Affecting Education", one of which summarized legislation affecting the financial support of schools. One circular has also been issued on legislative action in 1934 affecting education and another circular is now in progress. Reviews of significant phases of current educational legislation were also prepared for publication in October, December, and June issues of School Life. Other studies completed in the field of school law include an analysis of the principal provisions of State-wide systems for the retirement of public-school teachers (Bull., 1934, No. 6), and The Legal Status of Married Women Teachers (Pamphlet No. 47).

School legislation studies now in progress include a biennial review of outstanding educational legislation for 1933 and 1934, and a school legislation handbook consisting of summaries of legislative tendencies and present legal status of major phases of education.

ELEMENTARY EDUCATION

Much of the work in the field of nursery-kindergarten-primary education during the past year has been directed to further emergency programs and to meet the widespread interest aroused in the education and welfare of very young children.

Information regarding the State and city support of educational programs for children 4 and 5 years of age was summarized for distribution. This summary indicates that local interest and information concerning the values of educating children prior to 6 years of age are as potent factors in securing educational programs for children of this age as is legislation. However, in support of legislation, the summary shows that more cities maintain kindergartens when State laws require that parents' petitions for such schools must be granted and where the laws designate that their support shall be cared for from the general school fund rather than from an easily eliminated local or special tax.

Summaries of studies were made which show the relative progress through the upper elementary grades of children starting school with and without kindergarten experience. Material to aid parents in carrying on educational activities in the home has been put in permanent form. Bibliographies have been prepared on nursery education, on the teaching of reading and arithmetic, on pupil rating and pupil progress and on sources of help for classroom teaching problems.

SECONDARY EDUCATION

During the year the publication of the monographs of the National Survey of Secondary Education was completed; the entire report of the survey is now available. In cooperation with the national committee on research in secondary education we have made a study of needed research in secondary education, the publication of which will serve as a sequel to the survey. An analysis of numbers of schools, teachers, and pupils at the high-school level in cities of over 10,000 population was made. The study dealt with different types of high schools and showed trends over the period 1918–32.

STATISTICS OF EDUCATION

The function of the Office as a clearing house for data on all forms of education on a national scale has made the collection, tabulation, and dissemination of statistical information one of its major duties.

The use of a small field staff not only enables the Office to obtain approximately 100 percent of the reports, but provides experts in school records and accounts who can help local educational authorities with their recording and reporting problems and aid in establishing more uniform record systems in all parts of the country.

The emergency in education created a major statistical problem during the year. The demand by Congress and the public for information on the condition of schools necessitated special studies for city schools, all public schools, and for institutions of college grade. Our file of statistical reports was used especially by the Public Works Administration, Reconstruction Finance Corporation, Federal Emergency Relief Administraton, and Tennessee Valley Authority in checking data on school systems and institutions. The statistical field force spent considerable time assisting the Federal Emergency Relief Administration.

Special notice should be taken of the fact that the statistics of State school systems, 1931–32, published this year, include a fuller analysis of data and graphical presentation than usual, and for the first time a number of tables giving State figures for rural and urban schools in comparable form.

In the interest of more uniform reporting the State Department of Education of Iowa was assisted in setting up a new system of records and reports.

TABLE 1.—*Review of statistical work 1933–34*

Subject of study	Type of study[1]		
	Biennial	Periodic	Special
Statistical summary of education	T		
State school systems:			
Personnel and finances	T		
Consolidation and transportation of pupils			T
Effect of economic situation			C-T
City school systems:			
Personnel and finances	C		
Per capita costs		C-T	
Effect of economic situation			C-T
Grade enrollment			T
Expenditures of operation of plant			T
Expenditures for fixed charges			T
School buildings			T
Higher education:			
Personnel and finances	T		
Land-grant colleges		C-T	
Effect of economic situation			C-T
Cost of going to college			C-T
Student aid			C-T
Residence and migration of college students			T
Financial problems of colleges			C-T
Secondary schools:			
Public:			
Personnel		C	
Subject enrollment		C	
Private:			
Personnel		C-T	
Subject enrollment		C	
Accredited		C-T	

[1] C is collected; T is tabulated.

TABLE 1.—*Review of statistical work, 1933–34*—Continued

Subject of study	Type of study		
	Biennial	Periodic	Special
Elementary schools:			
Public:			
Administration, city, county	----------	----------	C-T
Private:			
Personnel	----------	C-T	----------
Commercial schools, private:			
Personnel	----------	C-T	----------
Teaching staff, physical care of teachers	----------	----------	T
Negro education	----------	T	----------
Personnel and finances	----------	----------	----------
Availability of rural education	----------	----------	C-T
Guidance, case studies	----------	----------	T

COLLEGIATE AND PROFESSIONAL EDUCATION

The financial distress of colleges and universities has been a problem of major importance this year. Minor investigations required to satisfy requests for information occupied considerable attention of staff members. Two studies of wider scope were made: (1) The economic outlook in higher education, and (2) financial status of the smaller colleges.

Teacher unemployment and the danger of lowering of standards of teacher education led to the conduct of a study on the certification of teachers which is now in progress. This study follows the virtual completion of the 3-year program of research by the National Survey of the Education of Teachers, authorized by Congress and conducted under the auspices of the United States Office of Education.

A study of graduate work in American colleges and universities has been completed. This study shows the development of graduate work since 1642 and the evolution of standards and practices for the awarding of the master's and doctor's degrees.

A cooperative study sponsored by the National Committee on Music in Education concerning the preparation of music teachers, was begun in 1933. The returns have been received and a report is being formulated.

An investigation was made of the cost of going to college in 1,600 institutions of higher learning throughout the United States.

The educational directory was changed in organization, bringing together in one place all the facts about each institution and also bringing together all the institutions in each State.

A study of the supervision exercised by States over privately controlled institutions of higher education was completed during the year. This study showed for each State the legal requirements with which such colleges and universities must comply in obtaining their charters of incorporation, and the laws providing for their supervision after the charters are granted. A special phase of the study gives in-

formation regarding the States which have adopted restrictions upon privately controlled institutions in the conferring of academic degrees.

A study of the extent and historical development of privately controlled higher education in the United States laid special stress upon the relation of the colonial and State governments to privately controlled colleges and universities.

TEACHER PREPARATION AND PERSONNEL

Research was conducted by the Office of Education during the past year in the field of teacher preparation and personnel through the National Survey of the Education of Teachers, a 3-year investigation authorized by Congress at a cost of $180,000. The survey is practically completed, and the printed report will be available in 6 volumes. One, a bibliography on the education of teachers, was distributed last year. A second, which discusses the education of Negro teachers, was distributed during 1934. Three of the remaining four volumes, on teacher personnel, teacher education curricula, and special survey problems, have been sent to the printer. The last, a summary volume, will be completed during 1934. The results of this investigation, which is the most extensive ever conducted, are in considerable demand throughout the country by investigators and workers in teacher preparation. One example of this demand is afforded by the National Society of College Teachers, which plans to devote its current yearbook to a discussion of survey findings. Both institutional and State authorities, as well as strictly professional groups, should find the results of the survey of assistance in the develompent of their local and State programs of teacher preparation.

EDUCATION OF NATIVE AND MINORITY GROUPS

The Office of Education has continued its services—research, informational, and advisory—in the education of native and minority groups in continental United States and its outlying parts, involving the educational welfare of approximately 15 million people widely scattered throughout the world.

Two bulletins completed during the year are now in page proof; one a description of educational conditions and progress in Puerto Rico, and one similar in type concerned with the Virgin Islands. These are the result of personal investigations in the respective insular groups. Two extensive reports were finished; one on Education among Native and Minority Groups in Alaska, Puerto Rico, Virgin Islands, and Hawaii for the January 1934, issue of the Journal of Negro Education; the other, a comprehensive description of education in rural communities of the United States prepared for the Inter-American Education Federation conference to be held in Santiago, Chile, in September 1934.

The division has continued its services on educational problems concerned with the teaching of English to children from foreign language speaking homes. Bilingualism offers difficult problems in teaching, both in continental United States and outlying parts such as Puerto Rico, the Philippine Islands, and Hawaii. Bibliographies on different phases of the problems involved have been prepared and one covering the subject as a whole completed during the year is now being printed as No. 23 of the Good Reference Series.

EDUCATION OF EXCEPTIONAL CHILDREN

This service of the Office of Education continues to stand for adequate educational adjustment for all children who deviate seriously from normal in physical, mental, or emotional status. The program of the past year has included consideration of classroom problems, research projects, and bibliographical work.

To help the teacher of exceptional children in the classroom, the series of pamphlets begun during the previous year on "Teachers' Problems with Exceptional Children" has been developed. Of the 8 pamphlets projected, each dealing with a particular type of child, 6 have either been released or are in press. In addition to these, specific suggestions for classroom activities for retarded children have appeared both in a printed bulletin and in three supplementary typed loan books available for circulation. A similar book containing activities for gifted children has been prepared and is in use. Also a set of lantern slides depicting these activities is in circulation. All these materials have proved to be much in demand.

Foremost among the research projects undertaken has been a survey of employment possibilities of the deaf and hard-of-hearing financed by the Federal Civil Works Administration. This study was launched primarily as a guidance project, with the objective of ascertaining for which occupations deaf and hard-of-hearing children can most successfully be trained. Extensive field work, involving the services of over 300 persons in 27 States and the District of Columbia, has been completed and tabulations are in progress. A second research project of lesser scope has been continued from the previous year in cooperation with a city-school system, and is designed to throw some light upon the value of special classes for retarded children.

A series of circulars was issued as supplementary to a bibliography on the education of exceptional children printed several years ago.

EDUCATION OF NEGROES

Four major studies on the education of Negroes have been issued by the Office during the past year, namely: (1) Survey of secondary education for Negroes; (2) survey of the education of Negro teachers;

(3) a study of rural education among Negroes under Jeanes supervising teachers; and (4) a background study of Negro college students.

Another study which is nearly completed investigates the availability and accessibility of schools and the quality of education furnished Negro children in rural communities. All the data for this study have been collected and tabulated, and the report is now being written.

Through the cooperation of the Federal Emergency Relief Administration a follow-up investigation of the background study of Negro college students was begun. The immediate aim of this study is to ascertain the relation of certain background factors to subsequent success in college. The ultimate purpose, however, is to establish trends and to evaluate procedures in the field of student personnel.

The preparation of the proceedings of the National Conference on fundamental problems in the education of Negroes is now under way and is expected to be issued by the Office in the fall. This will consist of a digest of the committee reports made to the conference, together with some of the more important addresses. It will also contain suggestions helpful to schools, teachers, administrators, and organizations in appropriating some of the important values of the conference and in adapting them to their local and special needs.

SCHOOL HYGIENE, PHYSICAL EDUCATION, AND RECREATION

The teacher can only do her best work when she is in her best condition, physically and mentally. While her fitness depends largely on her own conduct her employers have a considerable responsibility for her welfare. We have completed an investigation into what school authorities, in cities of 5,000 population and over, are doing to preserve and promote the health of teachers in the way of medical service, and the granting of sick leave and absence for study or recreation.

While instruction in the effects of alcohol and other narcotics has long been required by law, the repeal of the eighteenth amendment renews the importance of such instruction. As an aid to those who are preparing courses of study in this field we have prepared a brief review of earlier pedagogical methods and of present trends in such education, together with selected references on the subject.

All phases of school health work center in the elementary grade teacher, but for her work in this field she needs adequate preparation. A few teacher-training institutions are giving the needed instruction, and we have asked these schools for an account of their methods which we hope to publish.

Studies of the physique and carriage of school children were made during the year, and the project in this field is about completed.

GUIDANCE AND INDUSTRIAL EDUCATION

As a result of the growing recognition of the importance of guidance in the program of education, attention is being directed not only to provisions for new and specific agencies, such as counseling, for the realization of guidance objectives, but also to an analysis of various kinds of school activities that may be made to contribute to the guidance function. In line with this tendency this Office made studies of two kinds of school activities that have guidance values. One of these was a study of opportunities provided in high schools for instruction in occupational information. It has been known that, for a score or more of years, some high schools of this country have been giving instruction in this subject, but to what extent such courses were being given was a matter of speculation. The study conducted by this Office included special reports from 1,111 representative public high schools, of various kinds and sizes, that cooperated in providing for publication, information on instruction given in occupational information. The other study dealt with school clubs and had as its aims the determination, by means of representative sampling, of the extent of the development of clubs in public high schools, the kinds of school clubs, their organization, and the kinds of work carried on in this extra-curriculum type of school activity. Junior and senior high schools to the number of 883 cooperated with this Office in supplying information for the study which was compiled for publication.

An increasing interest in technical and industrial education is manifest in all industrial countries. This Office assisted the International Bureau of Technical Education, in the study of this phase of education in many countries, by furnishing information on the situation in the United States. The material gathered by the International Bureau was published and became the basis for discussion at the Conference on Technical Education held at Barcelona, Spain.

EDUCATIONAL MEASUREMENT

Service in this field was continued with the objective of encouraging more accurate methods of evaluation and direction of education. One study in line with this objective has been that of the use of tests and measurements for the determination of admission and guidance of entering college freshmen. The resulting bulletin (in press) describes the techniques necessary for setting up the more accurate methods for predicting college success and gives the results of investigations.

A study of the techniques and tests which may be used to distinguish between the strengths of the abilities of pupils has been published under the title "Differential Diagnosis of Ability in School Children."

An analysis of the possible use of tests for purposes of determining high-school accreditation has been made. It was found that the test results ordinarily found in high schools are not sufficient for the purpose. The methods which may give accurate results have been discussed. This study is being issued in the (mimeographed) circular series.

A study, under way in the elementary field, is concerned with the methods used by schools in promoting pupils. This study will attempt to bring together some unity in the thinking in this field and will show the actual practices of the schools.

ADULT AND PARENT EDUCATION

Adult education activities of the specialist in this field have been conducted principally in connection with the Federal Emergency Relief Administration.

A study was completed during the year of the activities and projects of many agencies and institutions now at work in parent education. In addition to colleges and universities this includes the work of State teachers colleges, State departments of education, public schools, and organizations of various kinds.

Suitable literature has been pointed out to parents in various ways, through the preparation and distribution of bibliographies, reading courses, and during the past year particularly, by the preparation and distribution of a series of reading guides called "Searchlights."

Parent-teacher associations have become increasingly important to public and private schools. Such associations in elementary schools are becoming generally more successful but difficulties have been met in adjusting programs and projects to the needs of parents of high-school boys and girls. In response to an invitation from the national congress of parents and teachers the Office has instituted a study of successful organizations and programs of associations for high schools.

COMPARATIVE EDUCATION

The associate specialist in foreign education spent 2 months in Czechoslovakia studying its educational system. Studies were made of institutions of higher education in Denmark; education in India; national aid for school-building construction in England, France, and Belgium; courses in organic chemistry in secondary schools in Germany; and schools of fishing in foreign countries. A comprehensive list of references on foreign and comparative education was prepared.

Mainly by correspondence, but occasionally by personal contact, the division aided and directed 153 studies in comparative education ranging in scope from term papers to theses for the doctorate.

Among these were the collection of data from 12 European countries on the training of handicapped children for the New York City school authorities, teacher-training in Switzerland, and nurse-training in other countries. A record of current foreign education publications was prepared for the use of students and published in the Elementary School Journal.

VISUAL EDUCATION AND EDUCATION BY RADIO

Much of the time of the specialist in this field was occupied with the preparation for and attendance at the International Congress of Educational Cinematography which was held in Rome. Two conferences on education by radio, called by this Office, are mentioned in more detail elsewhere in this report.

SCHOOL LIBRARIES

The rural-school library study which has been carried on under a grant-in-aid from the Carnegie Corporation was completed this year and was published by the American Library Association under the title "A Study of Rural School Library Practices and Services." The subject matter consists largely of first-hand information which was secured by the specialist in school libraries in visits to 42 States.

In addition to this piece of work a study of Aids in Book Selection for Secondary School Libraries has been completed.

STATUS OF NATIONAL SURVEYS

All of the 28 monographs reporting findings of the national survey of secondary education came from the press and are now available from the Superintendent of Documents. During the fiscal year of 1933 the Superintendent of Documents sold 13,868 copies of these monographs.

The manuscript of the National Survey of the Education of Teachers is completed. The sections entitled "Selected Bibliography", and "Education of Negro Teachers" were published during the year and the remainder of the report will be available in the near future.

The third national survey, that on school finance, was completed and published before the beginning of the fiscal year.

HISTORY OF EDUCATION

In line with a policy of long standing the Office has this year published two volumes on the history of education: The History of Education in the State of Washington, by Dr. Frederick E. Bolton, and The Federal Cooperation in Agricultural Extension Work and Vocational Education and Vocational Rehabilitation, by Dr. L. E. Blauch.

2. STIMULATION AND COORDINATION OF RESEARCH

COLLECTION OF UNPUBLISHED RECENT RESEARCH

For the past few years we have been developing a record of contemporary research conducted in various educational institutions and have collected as far as possible and made available for general use, the studies completed by those seeking advanced degrees in colleges and universities.

Our 1932–33 bibliography of research in education lists 4,061 masters' and doctors' theses and faculty studies in the various fields of education completed between September 1, 1932, and August 31, 1933, reported by 128 colleges and universities.

We have, available for interlibrary loan, 1,394 masters' and doctors' theses on all phases of education, placed in our library by 54 colleges and universities. Several institutions have made us a depository library for receiving and loaning copies of all of their theses in education. The thesis collection is in constant use in the library and a total of 446 theses has been loaned to colleges throughout the country.

We have author and subject catalogs of this collection. In response to letters from graduate students and faculty members of institutions of higher education, we compile lists of theses available for loan, and lists of those reported to us as having been completed since the last printed bibliography, to assist them in determining what studies have been made in the various fields in which they are working.

Annually we issue mimeographed lists of research and investigations carried on by State departments of education and State education associations, and by city school systems, containing studies completed during the previous school year which are on file in the library, those in progress and those contemplated.

COOPERATIVE STUDIES

The Office is working with other organizations on certain projects in which mutual assistance seems desirable. With the National Association for Nursery Education we are making a bibliography on nursery education; with the National Committee on Research in Secondary Education we are preparing a list of suggested research studies; with the National Committee on Music Education we are investigating the status of music in education; with the Society for the Promotion of Engineering Education we are conducting a survey of graduate work in this field; with the National Congress of Parents and Teachers we are studying the problem of improving programs of parent-teacher associations in high schools and with

the school systems of Minneapolis, we are investigating the values of special classes for retarded children.

3. SURVEYS CONDUCTED BY THE OFFICE

The following surveys of educational work were completed during the year or are in progress:

Rockland County.—At the request of citizens interested in the improvement of the educational program of Rockland County, New York, a survey of that county was undertaken by this Office. The present school plant and services, the social composition of the component communities, the major population movements of the county and other pertinent conditions are being examined to determine: (*a*) The various types of education which would constitute an optimum program of education suitable to the needs of all groups comprising the county, and (*b*) the best present utilization and future development of school buildings and equipment in relationship to a modern comprehensive program of education.

Appalachian region.—A statistical and graphical survey of the southern Appalachian mountain region recently made by this Office is now being published by the United States Department of Agriculture. In the making of this survey it became apparent that social and economic conditions in many of the southern highland counties were so undeveloped as to constitute a peculiar educational problem which should be examined more analytically. A study was, therefore, undertaken to make these peculiar problems stand out and to show how these problems are being attacked. This study is now nearing completion.

Public school needs for Federal aid.—The statisticians of this Office, with the assistance of the directors of education research in Arkansas, West Virginia, and Texas, were requested by the Federal Emergency Relief Administration to aid the States in ascertaining how much Federal aid was needed in order to keep the schools open the normal term in places of 5,000 population and less.

When the applications had been received the Office statisticians were asked to check the returns in cooperation with the State educational and relief officials to determine the final amount to be alloted to each State.

Oklahoma City.—The Office has assumed the direction of the curriculum study of the colored high school of Oklahoma City. This work will extend over a period of a year or more, and will include a limited social and economic survey of the community; a study of the drop-outs and graduates of the high school during the past 10 years; and a personnel study of the present student body. Also, some attention will be given to the relation of the elementary schools

to the high school. It is to be a cooperative enterprise involving the teachers as well as the patrons.

Cincinnati.—In June we accepted the invitation of the Cincinnati Bureau of Governmental Research to make a comprehensive survey of the public schools of that city. The invitation followed the formal resolution and request of the Cincinnati Board of Education to the Bureau to have such a study made. This survey presents a somewhat unusual problem in that the survey of Cincinnati's schools is in reality a part of a larger study of all child-welfare services of the community including recreation, health, and care of juvenile wards, each phase of the study being made by a separate group, but with the assistance of the Bureau of Governmental Research.

4. CONFERENCES

Conferences called by the Commissioner in regard to the financial situation in schools and colleges and with reference to the problem of unemployed youth are mentioned in the first section of this report. In addition, meetings were arranged by this Office for the discussion of the following subjects:

Educational measurements.—Persons engaged in the administration of and experimentation with tests and measurements in secondary schools were called together for a conference on equivalent and comparable scores on the secondary school level. There was a discussion of (a) the desirability of having equivalent and comparable scores and (b) how such scores might be established. It was the consensus of opinion that there was a need for such scores in order to facilitate the use of cumulative records for guidance purposes. It was recommended that further study of the problem be made and the United States Office of Education take the initiative in the project.

Education of Negroes.—The National Conference on Fundamental Problems in the Education of Negroes had for its object a consideration of the special and peculiar problems involved in the education of Negroes which arise from their economic and social status, and to focus the attention of the Nation on the educational disadvantages experienced by them. The work of the conference was performed by 14 committees over a period of several months. More than 1,000 persons registered for the meeting, 500 of whom were from 28 different States.

Motion pictures in education.—On the invitation of the Commissioner, 35 representatives of various governmental, educational, and motion-picture agencies met to prepare a composite report on the use of motion pictures in education. This report was issued as a mimeographed circular of the Office.

Motion-picture appreciation.—In cooperation with the Payne fund, a National Conference on the Teaching of Motion-Picture Appreciation

was held. About 30 representatives of the Government and national voluntary agencies participated in planning an experiment in teaching motion-picture appreciation. This experiment is being carried out in the high schools of Connecticut, Ohio, North Carolina, Iowa, and California.

Overworked textbooks.—Reduction in expenditures has, in many schools, extended to the purchase of textbooks with the result that these are used by more pupils in the same session and for a longer period of years. As a result the books become not only unsightly but insanitary. A conference on this subject called by the Office resulted in the publication of a circular, Overworked Textbooks, which warns of the menace from this method of economy.

Financial aspects of the consolidation of schools.—This conference was called at the request of a number of directors of finance in State departments of education to consider the results from the financial point of view of consolidation of schools and the combination of districts. Reports presenting data from county and State-wide studies in six States showed material economies effected by such procedures.

Two conferences were held to consider means of aiding the Office in its work with the Federal Emergency Relief Administration's program for the development of nursery schools. Representatives of three professional organizations attended the meetings.

5. OTHER EDUCATIONAL SERVICE

COOPERATION WITH PROFESSIONAL AND PUBLIC-SERVICE GROUPS

There is an increasing demand on the Office for cooperation with educational agencies making studies and conducting conferences on current problems in education. The amount of service that can be rendered by the present staff is, however, limited. We mention here some of the agencies with which the Office worked during the past year:

For the Bureau of Internationale d'Education, Geneva, Switzerland, we prepared a report on education in the United States for the year ended June 30, 1933. We helped the yearbook commission of the department of superintendence of the National Education Association in the preparation of its yearbook. We assisted the Bureau Internationale de L'Enseignement Techniques, Paris, France, in the selection of topics for discussion at the meeting called by the Bureau and prepared information on technical education in the United States which was published in the report issued by the Bureau. A staff member served as chairman of the National Education Association committee on social-economic goals of America, which prepared a report on 10 major goals in these phases of educational objectives. One of the staff served as a member of the National Association of High School Principals' Commission on the Reorganization of Secondary Education.

Manuscripts submitted by contestants in the prize essay contest of the Gorgas Memorial Institute were graded. The State Department of Education of Iowa was assisted in the organization of a new system of records and accounts. The national committee on research in secondary education was aided in its work. We assisted the committee on standards in industrial arts of the American Vocational Association in the preparation of a report on standards of achievement in the junior high school. The committee on State guidance programs of the National Vocational Guidance Association was aided in the preparation of a report on guidance activities sponsored by State departments of education. The American Library Association was assisted in a study on library planning. A section on school health work was prepared for the yearbook of social work of the Russell Sage Foundation. A member of the staff participated in the institute for the training of field workers conducted by the National Tuberculosis Association. We assisted the State Parent-Teacher Associations of Maryland and South Carolina in the organization of their programs of study, and a number of colleges were advised relative to the use of certain specific tests for predicting direct and differential college success.

CONSULTATIVE AND ADVISORY SERVICE

Besides service rendered through cooperative undertakings, by surveys, through participation in general conferences, through publications of the Office, by contributions to educational journals, and through public addresses, much of the time of the staff is given to the assistance of school administrators, teachers, students, parents, and others in their individual problems. Many persons seek information and advice by personal interview and there is a host of requests by correspondence for specific data and for direction in studies in every field of educational interest.

ARTICLES AND ADDRESSES

Although the staff of this Office was much reduced, more than 75 articles were written for publication in periodicals and yearbooks, and during the year over 200 addresses were made before National, State, regional, and local groups. Thirteen radio talks were prepared and broadcast.

EVALUATION OF FOREIGN CREDENTIALS AND ASSISTANCE TO STUDENTS ABROAD

The division which deals with comparative education problems handled, at the request of college and university registrars and committees of admission, 504 cases of evaluation of foreign student credentials with 1,197 separate documents in 21 different languages. With respect to country of origin the cases came from 70 political

divisions, the largest number being from the Germanic language countries. In addition, 77 cases were reviewed for one or another reason.

Many visitors from other countries, including India, China, Western Australia, Union of South Africa, France, and England, who came to the Division were aided and we advised other foreign visitors by letter. We made arrangements for an official delegation to attend the Third International Conference on Public Education held at Geneva, Switzerland, in July of 1934; wrote letters of introduction for and gave advice to Americans going abroad to study education; advised with and aided the Institute of International Education to prepare a guidebook for foreign students in the United States, and selected a list of American educational publications for the Institute of Intellectual Cooperation in Paris.

LIBRARY SERVICE

The library has continued its work of building up as complete collections of official publications as possible to furnish original source material; these include annual reports from State and city school departments, proceedings of State and National educational associations, complete files of educational journals, files of catalogs of higher educational institutions, textbooks used in the schools as far back as possible and to date, and books and monographs.

A collection of old educational periodicals and textbooks from 1850 to date, was cataloged during the year; a section of very old and rare American textbooks dating back to 1780 was listed with descriptions; an already large collection of courses of study both State and city in the various subject fields was augmented during the year, and a revision of the published list of such courses is well under way.

PUBLICATION SERVICE

The editorial and duplicating sections of the Vocational Education Division were consolidated with the regular Office Editorial Division during the year. As a result of this merger, the Editorial Division now handles such duties for the entire Office.

The work of putting informational material into print and the distribution of publications is furnished in the following statistics:

I. PREPARATION

	Number	Number of pages
Manuscripts read and edited for:		
1. Printing	68	[1] 6, 752
2. Mimeographing and multigraphing	57	1, 900
3. School Life (10 issues)	275	1, 650
Galleys of proof read	---	1, 796

[1] In addition, 4,417 bibliographical entries were read and edited.

I. PREPARATION—continued

	Number	Number of pages
Pages of proof read		4, 249
News releases for newspapers and magazines	55	220
Radio transcripts for broadcasting	13	130

II. DISSEMINATION

	Free, 1934	Sales, 1933
Bulletins, pamphlets, leaflets	243, 400	113, 268
Circulars (mimeographed)	150, 630	-------
School Life (10 issues)	19, 100	117, 624
		1934
Reprints from School Life, extra editions, index	22, 500	-------
Circular letters and miscellaneous mimeograph, multigraph and rotoprint information----------pages	1, 008, 268	-------
Good reference series (mimeographed)	5, 530	-------
Reading courses, etc	11, 300	-------
Price lists (mimeographed and printed)	82, 000	-------
General information notices and advertisements	434, 906	-------

Sales of vocational education and rehabilitation bulletins, in addition, totaled $2,674.32 during the year.

The Office issued 125 publications during the year, 68 printed and 57 mimeographed, multigraphed, or rotoprinted. Improvement in appearance of Office bulletins through use of additional illustrations, more artistic typography, and better quality paper, continued to result in general commendation and increased sales.

School Life.—This official monthly journal of the Federal Office of Education continued to enjoy the largest sale of any Government subscription publication. Sales of School Life in 1934 jumped to 117,624 copies from the 1933 sales of 82,638. During 1934 School Life reported the latest facts and statistics on the emergency in education, with special emphasis on the national recovery program and its educational implications.

Through an authorization by the Bureau of the Budget, School Life was increased in size from 20 to 24 pages during the year so as to report vocational education information gathered by vocational education specialists now on the regular office research staff.

News releases.—Fifty-five news releases announcing new Office publications and important educational information were prepared and mailed during the year to educational journals and newspapers in general.

Directories.—One of the major tasks of the Editorial Division during the year was the compiling of the 1934 Educational Directory, widely used by educators, citizens, and business people. The Directory was issued in four parts: Part I, Principal State and County School Officers and Other Education Directories; Part II, Principal City School Officers and Catholic Parochial School Superintendents;

Part III, Colleges and Universities, Including all Institutions; and Part IV, Educational Associations, Boards, and Foundations.

Radio service.—Through the courtesy of the National Broadcasting Co., the Federal Office of Education is now on the air to furnish important educational information once a week over a national network of radio stations. Nine such weekly broadcasts were made since this new method of disseminating Office of Education reports and current educational news was inaugurated.

Exhibits.—The Office supplied exhibits of its publications and services at approximately 25 educational meetings and conventions including the summer and spring conventions of the National Education Association. A special exhibit was prepared for display at the Century of Progress Exposition.

6. ADMINISTRATION

APPROPRIATIONS

Because of the reduction in appropriations it was again necessary during the year to eliminate a number of persons from the staff. The total number eliminated since April 15, 1933, is 17. In this number were included specialists in fields which must again be represented on the staff as soon as circumstances permit.

For the fiscal year 1934, Congress appropriated the sum of $250,000 for salaries in the Office of Education, not including those for vocational education and rehabilitation. Of this amount only $215,725 was made available for expenditure during the year. The amount available for 1935 is $228,801. The increased amount available for 1935 is not due to any expansion in the staff, but is due entirely to the partial restoration of salary reductions.

HOWARD UNIVERSITY

Howard University was inspected during the year 1933–34, by the Office of Education, according to law. Among the developments of the year the following are of particular interest:

The school of education and the courses in art and home economics were merged in the college of liberal arts. The graduate school and the school of engineering and architecture were established and will begin functioning in the fall of 1934.

In order to offset losses in enrollments the trustees provided special scholarship funds and opportunities were offered needy students to participate in the aid provided for by the Civil Works Administration.

The law school was elected to full membership in the American Association of Law Schools.

There has been some reduction in the number of the teaching staff, and drastic reductions have been made in income and expenditures.

Great improvements in the physical plant are now under way.

There has been a great increase in all artistic activities of the university. The purchase of a new organ has been authorized for the school of music.

Student body.—The grand total enrollment of the university for 1933–34 was 1,626, of whom 939 were men and 687 were women. For the year preceding the enrollment was 1,893, of whom 1,094 were men and 799 were women. This indicates a net loss of 267 students or approximately 14 percent of the enrollment as compared with the net loss of 571 or approximately 23 percent for the preceding year.

One hundred and three students out of this net loss of 267 are to be accounted for by the discontinuance of the correspondence and theological college courses in the school of religion. Of the remaining 164 a loss of 151 is indicated in the undergraduate colleges, principally in the college of education where there was a loss of 144. This loss is almost wholly traceable to the discontinuance of the summer school which registered 291 students last year, 170 of whom were students in the college of education.

Medicine, dentistry, pharmacy, and law registered a net loss of only 11 students.

Teaching staff.—The teaching staff of the university in 1933–34 included a grand total of 237 members, of whom 135 were full-time and 102 were part-time. These are the equivalent of a full-time staff of approximately 154 teachers. This shows a decrease of 18 full-time teachers and 20 part-time teachers from the number of teachers employed in 1932–33. These reductions have been found necessary by reason of the decrease in enrollment and by curtailment of the income of the university.

Financial statement.—In 1933–34 the total income of the university was $1,180,958.34,[1] of which $715,282.76 [2] was from the Federal Government and $465,675.58 from private and institutional sources. In 1932–33 the income from the Federal Government was $661,422.27 and from private and institutional sources $429,422.52, a total of $1,090,844.79. However, 1933–34 includes extension fund income and gifts of $122,051.50 as compared with $51,815.61 for the preceding year and receipts from the Federal Government for reconditioning and repairs of $77,801.85, without counterpart in the preceding year.

In 1933–34 the total operating expenditures were $1,040,418.94, as against $1,046,328.47 in 1932–33.

Physical plant.—During the year 1933–34 the contract was let for the construction of the new classroom building at a cost of $460,000 and considerable progress had been made in the construction of this new unit by the end of June. The contract had also been let for the erection of the new chemistry building at a cost of $475,500. The

[1] Including extension fund $122,051.50 as against $51,815.61 the preceding year.
[2] Including reconditioning and repairs of $77,801.85.

plans for the new heat, light, and power plant were ready for bids and the final plans for the new library were expected to be ready in August 1934. Considerable delay was caused in all this construction by the labor strikes incident to the new code arrangements. An appropriation of $98,811 by the Public Works Administration enabled the university to carry through extensive alterations and repairs in connection with the buildings and grounds. This work was enhanced by additional allotments of labor and materials from the Civil Works Administration.

REPORT ON LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is authorized by Congress to require annual reports in detail from the treasurers of the several land-grant institutions of the disbursements of the annual income received by them under the Land Grant Act of 1862 and supplementary acts, and annual reports from the presidents regarding the general operations of the institutions. This duty has been assigned by the Secretary of the Interior to the Office of Education.

Land-grant colleges and universities, generally known as agricultural and mechanical colleges, were established following the passage of the first Morrill Act of 1862. By the terms of this act, each State was entitled to receive an amount of public land (or land scrip) equal to 30,000 acres for each Senator and Representative in Congress to which such State was then entitled for the "endowment, support, and maintenance of at least one college where the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." This land is being gradually sold to create an endowment fund which in 1932–33 totaled $22,781,465. In addition there remained more than $6,000,000 worth of unsold land. The income from such fund and lands amounted to $971,254 for that year.

By the second Morrill Act of 1890 and the Nelson amendment of 1907, the Federal Government aids these institutions further; since 1911 each State has received from the United States Treasury in accordance with the Morrill-Nelson Acts $50,000 annually to be applied to salaries and facilities for instruction in specified subjects. Of the total appropriations in 1932–33 ($2,550,000) spent for instruction in specific subjects. The expenditure for salaries was $2,541,128 and $18,537 for facilities for instruction. These figures include $7,592 balance from previous year, and $8,038 interest on deposits. Balance, $5,962.78.

Thirty States and three Territories—Alaska, Hawaii, and Puerto Rico—maintain 1 land-grant institution each; Massachusetts maintains 2; and each of the 17 Southern States maintains 2, 1 for whites

and 1 for Negroes. About 175,000 regular students of college grade enroll annually during the academic year in the land-grant colleges, about 1 out of every 6 college students in the United States. The inventory of the land-grant institutions (1933) revealed that $550,305,675 was invested in the 52 institutions for white students, of which half was in buildings. In 1932–33 the total receipts of the 69 institutions amounted to nearly $140,000,000, of which there was derived from Federal funds a total of $20,626,900.

Since 1890 the land-grant institutions have depended upon the prompt and regular annual payment during July of the Morrill-Nelson appropriations. On June 10, 1933, the President of the United States issued Executive Order No. 6166 affecting the payment of this money as follows:

> SEC. 18. The following functions are abolished in part * * * Endowment and maintenance of the colleges for the benefit of agriculture and the mechanic arts, 25 percent thereof.

This order affected these continuing appropriations, and only 25 percent of the appropriation was mailed on August 2; another 50 percent was mailed during September. The question of the remaining 25 percent was in doubt until February 6, 1934, when in Executive Order No. 6585 President Roosevelt upon further investigation determined that the provisions of section 18 above-mentioned were not in the public interest or consistent with the efficient operation of the Government, and revoked the section. Shortly thereafter the final 25 percent payment of Morrill-Nelson moneys was made so that in the end the land-grant colleges received the same allotment as usual for 1933–34.

VOCATIONAL EDUCATION

LEGISLATIVE BASIS OF NATIONAL PROGRAMS

The Federal-State programs of Vocational Education and Vocational Rehabilitation have their basis in special acts of Congress and special State acceptance acts which provide appropriations of Federal and State matching funds for carrying on the work. The obvious intent of this Federal legislation is to stimulate and aid the States in maintaining specific types of vocational training and rehabilitation for workers in trade and industry and on the farm, and for homemaking, which would not otherwise be provided for in the regular public-school systems.

Acts administered by the Office of Education, under the direction of the Assistant Commissioner for Vocational Education, include the following:

The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)

The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of civilians disabled in industry or otherwise and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)

An act to provide for the vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)

An act (George-Reed) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1930 to 1934 additional appropriations for vocational agriculture and home economics. (Approved Feb. 5, 1929.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the island of Puerto Rico. (Approved Mar. 3, 1921.)

An act (George-Ellzey) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1935 to 1937, additional appropriations for vocational education. (Approved May 21, 1934.)

The George-Reed Act of 1929, authorizing annual appropriations for the 5 years 1930 to 1934, expired June 30, 1934, and Congress provided in the George-Ellzey Act of 1934 for continuation of annual appropriations during the years 1935, 1936, and 1937, additional, as were those of the George-Reed Act, to appropriations made by the Smith-Hughes Act. Allotments of appropriations made under this new act, based on the farm, the rural, and the nonfarm population of the States and Territories, were certified to the Treasury to be sent to the States in semiannual payments July 1 and January 1. Interpretation of the provisions of this act, and the formulation of policies to be followed in the States in utilization of the funds provided under it, especially with reference to utilization of these funds for the relief of unemployment, so far as the provisions of the act permit, has required special consideration by the Federal staff, and has necessitated a very considerable amount of correspondence and conference with State administrative and supervisory officials.

COOPERATIVE SERVICE TO THE STATES

Services rendered to the States in all fields of vocational education—agricultural, trade and industrial, commercial, home economics, and vocational rehabilitation—during the past year have dealt largely with emergency activities.

The staff has cooperated extensively with recovery agencies, one member of the trade and industrial staff devoting his entire time as liaison officer, to advise with the Administrator of the Federal Emer-

gency Relief Administration relative to the development of emergency relief programs in education and rehabilitation, and a member of the agricultural education staff devoting about half of his time to rendering similar service. Other staff members have assisted State departments in formulating plans for emergency relief educational programs. Services have been rendered also in connection with the organization of training programs for Civilian Conservation Corps camps, and for transient camps. These services have assisted the States in reorganizing their established vocational programs, State and local, and adapting them to the emergency situation. To this end conferences have been held with supervisors, teacher trainers, and teachers in all sections of the country.

At the same time the regular field services have been rendered during the past year as in other years, including the conduct of regional, State, and local conferences for administrators, supervisors, and teacher trainers to assist States and local communities in improving their regular vocational programs; inspection of schools; participation in summer conferences; and promotion of regular programs. Teacher training courses have been given by members of the staff at summer schools, and assistance rendered in organization of training programs to meet local community needs. These services rendered for the promotion of the established vocational and rehabilitation programs have extended to all of the States and to Hawaii and Puerto Rico.

The Farm Credit Administration, agricultural production-control, erosion-control, agricultural-planning, and land-utilization programs have developed new problems in farm financing, marketing, and management. The establishment of subsistence homesteads, the formulation of rural rehabilitation programs, the Emergency Relief Administration program of work relief for unemployed teachers, and the adoption of educational programs for Civilian Conservation Corps camps, as well as the continued backflow of population from city to country in the unemployment situation prevailing in industrial centers, and the unprecedented drought conditions, extending over a very large section of our agricultural areas, have created urgent demands for services of members of the agricultural education staff in cooperation with State staffs.

As a result of these concerted efforts the 5,000 agricultural teachers have been enabled to cooperate effectively in all sections of the country with Federal, State, and local agencies of agricultural adjustment and relief, in coordinating the established program of vocational agriculture with the programs of the newly established agencies.

In the field of trade and industrial education the reorganization of industry under the National Recovery Act has greatly increased the demand for conference work. Members of the trade and industrial

staff have conducted conferences in many of the States for training conference leaders and industrial supervisors. Surveys, either completed or in process during the year, have been made of changes in employment conditions under National Recovery Administration codes to determine specific needs for training; and an analysis made of all National Recovery Administration codes approved over a period of 6 months to determine provisions for apprentice training and for training adult workers in the codes.

Cooperative services have been rendered to assist States in reorganizing part-time general continuation schools, in developing multi-occupational programs, in developing training programs for selected industries and trades, in providing suitable training opportunities for boys and girls in the ages 14 to 18 who are not, in the present situation, being permitted to enter upon or continue in employment under State labor laws and National Recovery Administration codes, and in providing job-changing and occupational adjustment vocational traiuing for unemployed adults.

The Federal home economics education staff has cooperated with the Federal Emergency Relief Administration at national headquarters in outlining and compiling materials to be distributed to the States to aid in the emergency work. It has cooperated with State staffs in safeguarding the welfare of the family under the prevailing conditions of unemployment and diminished family incomes. It has planned with State staffs for locating production and service jobs in the community, and devising ways and means for bringing the unemployed workers of families in contact with such jobs. It has assisted States in developing training programs for home makers based upon surveys of local conditions affecting home life, and of actual conditions found in individual homes. Particular emphasis has been given to the development of adult programs of consumer education for the training of homemakers as buyers for the family, and conservers of family resources, as well as producers in the home. Emphasis has also been placed upon adapting day and part-time homemaking programs to local home and family needs in the emergency, and aid has been given State and local staffs in establishing and maintaining through homemaking departments, free school lunches for needy children. To promote economical utilization of family resources homemaking programs have particularly emphasized instruction in canning, drying, and otherwise preserving foods for future use, in economical selection, preparation, and service of foods, in gardening for home consumption, in renovating, repairing, and constructing garments; in renovating to make still usable in the home, cast aside furniture and household furnishings; in encouraging simple arts and crafts in the home as a source of revenue and in planning, at little or no cost, wholesome family recreation.

Homemaking staffs and classes have cooperated in locating families without resources and in helping them to help themselves in all possible ways, and have cooperated extensively with State staffs in promoting recovery measures through conferences on consumer education held to develop ways and means for incorporating such education into school programs. Field services to aid the homemaking teachers, supervisors, and teacher training staffs in the States in promoting established programs of home economics have been continued during the year as in other years, by means of regional conferences, participation in State and local conferences, official visits to States, and distribution of helpful materials.

In the commercial field, service has been rendered in counseling and advising State and local school authorities in developing training programs for distributive occupations. In response to requests for such services, 13 cities were visited by a member of the Federal staff during the period covered by this report.

The year was characterized by expansion of the program for vocational rehabilitation of persons disabled in industry or otherwise and their return to employment. The State of Washington initiated its rehabilitation program at the beginning of the year, bringing the number of cooperating States under the national program to 45. Some indication of the extent to which the program has expanded and the demand for service to aid the States in promoting this work has increased, may be given by noting that the number of disabled persons rehabilitated and placed in employment increased 44 percent, and the number of persons served in the States increased 20 percent, over the year; that the scope of occupations in which the physically disabled are being rehabilitated has been broadened; that better cooperation has been secured from employers; that an increased personnel in the States has been provided for carrying on the work; that cooperation with other State and local agencies has been more effective; that new types of service have been rendered; and that material reduction in cost per case served has been effected. The expansion of this service bears evidence of increased support by the public, by employers, by other State and local departments of government, and generally by private agencies engaged in rendering different types of service for disadvantaged persons.

In part the expansion of the rehabilitation service has been made possible through Federal Emergency Relief Administration funds made available for allotment to the States in proportion to their population, needs, and ability to use this additional fund effectively.

During the year surveys were made to determine the number of disabled persons in selected cities, communities, or States. Earlier studies of this character had found the number to be approximately 6 per thousand population, but the surveys conducted during the past

year have found the number to be much greater. In the State of Mississippi, for example, which was completely covered by a house to house canvass, a recent survey found the number to be 30 per thousand population. On the basis of these more recent surveys the number of the permanently disabled persons may be conservatively estimated to range from 15 to 20 per thousand population.

Measures taken for the relief of unemployment under programs of vocational agriculture have included instruction in gardening in cooperation with organized charities; organization of class gardens for the needy of the community, and collection and processing of surplus foods for distribution to them; formulation of live-at-home programs for those with part-time employment; surveys of families returning to farms from industrial centers to determine their training needs; and training leaders for agricultural relief work. The 80,000 members of the Future Farmers of America also, comprising farm boys enrolled in vocational classes or graduates from such classes, have aided in rural relief work.

Unemployment in the trade and industrial field, as in other fields, is in large part a consequence of changing conditions, migrations of industries, mechanization of processes, introduction of labor saving machinery, substitution of mechanical power for man power, introduction of new materials and products, and the development of new technics of production. Such changes create demands for new trade skills and for occupational adjustment training of displaced labor groups. Vocational training agencies cannot create jobs for the unemployed, but training programs must be, and have during the past year been, continually modified to take account of the new requirements being imposed upon workers. Every effort has been made during the year, as, for example, through an extensive survey of changing economic and social conditions of the character noted above, to promote the development of programs to meet the needs of workers who have been thrown out of adjustment in their work environment and added to the number unemployed. Many adults in this situation have received instruction in vocational classes which has enabled them to secure employment.

As noted elsewhere, the home economics staff has cooperated in the unemployment situation with State staffs and with emergency recovery agencies through the formulation of programs of consumer education adapted to the needs of families with incomes reduced in consequence of unemployment of the family breadwinner. It has emphasized cleanliness, sanitation, and health in the home and the rendering of homes comfortable and attractive without money expenditure.

CONTRIBUTION TO THE RELIEF OF UNEMPLOYMENT

Provision of Federal Emergency Relief Administration funds enabled the States to make censuses of the disabled, survey industries for employment opportunities, and render constructive relief service in the form of vocational rehabilitation, thereby removing large numbers of the disabled from unemployment and dependency relief rolls, and enabling them to support themselves and in some instances their dependents. These programs have accordingly contributed materially to the relief of unemployment.

During the year cooperative working relations between State employment offices and rehabilitation departments have been set up in a number of States under section 7 of the Wagner-Peyser Act.

NEW PROBLEMS IN ALL-DAY SCHOOL VOCATIONAL PROGRAM

It may be noted that the public policy given effect under National Recovery Administration codes and child labor legislation, excluding from employment juniors 16 years of age and under, and in some States and some occupations those of more advanced ages, may be accepted as a permanent public policy for safeguarding the welfare of youths in these ages who in past years have entered part-time employment and attended part-time vocational schools. Temporarily this new policy has developed problems of unemployment and unadjustment among the youth of the population in all fields of vocational education. Effort has been made to bring these youths back into full-time school attendance, and to provide vocational programs in the day schools to meet the needs of such youths who, as is being generally realized, in many instances cannot benefit by additional instruction of academic character.

The character of the new and serious problems developing under National Recovery Administration codes and child-labor laws during the past year will be sufficiently obvious from the foregoing statement. In general these problems have developed in situations where school revenues have been reduced under pressure for economy and in the face of increasing enrollments of youths being excluded from employment and returned to the schools under compulsory attendance laws. Further problems have developed in respect to the conventional school program of instruction, which very generally has been developed along lines of academic disciplines, rather than of practical vocational interests. It is being realized that if these youths are to benefit from continued schooling, the instruction and training provided in the all-day school must be adapted to meet their needs and interests. The problems of the all-day school constitute in fact one large phase of the problem of our vocationally and socially unadjusted, and in many thousands of instances foot-loose, youths. In

the trade and industrial field especially these developments have meant practically complete discontinuance of the general continuation school for the 14- to 16-year-old group, and an increasing demand for expansion of full-time trade preparatory vocational programs.

APPRENTICE TRAINING

In another section of this report attention has been called to the establishment of a Federal committee on apprentice training by the Secretary of Labor under an Executive order of the President. A member of the trade and industrial staff has served on this committee as representative of the Division of Vocational Education of the Office of Education. The development of formal apprentice training plans under approved National Recovery Administration codes of fair competition will create new responsibilities for trade and industrial vocational programs, and new demands for service on the part of the Federal staff to aid the States in meetng these responsibilities.

OCCUPATIONAL ADJUSTMENT TRAINING

While in general working conditions for adult workers in different trades and industries have been improved under National Recovery Administration policies, many important questions involving the training of these workers have arisen. The new order of affairs with reduced hours and increased rates of wages has emphasized the importance of securing higher degrees of efficiency in the working personnel. Greater responsibility for securing and maintaining efficiency is being placed upon supervisory staffs throughout industry. Increasing opportunities for employment, following the prolonged period of depression, have developed new demands for occupational adjustment training to insure promotion of regularly employed workers to new jobs becoming available, to safeguard the welfare of workers in older age groups who require training in the new technics of industry or for new jobs in cases where the old job has been taken over by the machine or has been eliminated in the course of developing these new technics.

Under these conditions management in industry is realizing as never before the need for developing practical training programs that will up-grade their working personnel. Recent trends have been in the direction of a better understanding and a closer and more effective cooperative relationship between industrial leaders, labor groups, and State authorities responsible for the promotion of trade and industrial education.

PERMANENT vs. ANNUAL APPROPRIATIONS

Under the terms of the Smith-Hughes Act appropriations for vocational education were made permanent and continuing. This pro-

vision was written into the act to enable States accepting the act and local communities in these States to plan their budgets for utilizing Federal funds in advance, and with the definite assurance that Federal money would be available for reimbursement of their expenditures in designated amounts.

During the past year the general policy of making permanent continuing appropriations has been brought into question for Congressional inquiry, and after careful consideration of all conditions many such appropriations have been made subject to annual review by Congress. The Senate Committee on Appropriations of the last Congress, however, to whom the bill providing that certain continuing appropriations should in the future be subject to annual consideration and appropriation was submitted, recommended that the appropriations under the Vocational Education Act be continued as permanent appropriations, as provided in the original act. The committee reported that: "It is proper to make continuing appropriation of funds payable to the States so the legislatures thereof may unquestionably rely upon the receipt of such funds in making up State or county budgets."

RESEARCH

During the year the survey and analytical study of changing social and economic conditions and of the significance of these changes for programs of vocational education, begun 2 years ago at the request of the American Vocational Association, has been continued. This study has been made by a committee representing the agricultural, trade and industrial, and home economics staffs in the Vocational Education Division of the office. A general report covering the inquiry was in press at the close of the year.

Other research in progress during the year has included a study of sheet metal working in the aircraft industry to determine what should be included in a vocational training program for workers in this field; a study of retail salesmanship, to be used as a guide in adjusting commercial education training programs to include appropriate training for salesmen; a study of fireside or handicraft occupations, particularly in New England and Southern States; a study of the need and use of photographic films in vocational education; a cooperative survey of the vocational education needs of the city of Seattle; a survey made in cooperation with the American Vocational Association, State agricultural colleges, and other agencies, of investigations and studies in the field of agricultural education; a case study of former vocational agriculture students now operating farms; a study of potential locations for agricultural departments in high schools; a study of the organization of vocational agriculture training in small high schools; a study of possible bases for the evaluation of the home economics curriculum in high schools; curriculum revision

at all educational levels as it relates to home economics education; a study of consumer buying at the secondary school level; complete surveys of vocational rehabilitation programs in a number of States, six of which have been completed; a study of data to be incorporated in a handbook for rehabilitation workers; and a study of material to be incorporated in a bulletin on office procedure in vocational rehabilitation.

PUBLICATIONS

Vocational education publications issued during the year in the four fields—agricultural education, trade and industrial education, home economics education, and vocational rehabilitation—have included five publications prepared and issued by the agricultural service, as follows:

The Earning Ability of Farmers Who Have Received Vocational Training. Bulletin 167.

Analysis of Special Jobs for Farm Forestry. Bulletin 169.

Emergency Programs of Vocational Agriculture. Bulletin 177.

Reorganizing the Individual Farm Business. Monograph 18.

Suggestions for Teaching the Job of Grading Feeder and Stocker Steers. Leaflet 4.

Publications prepared by the trade and industrial education service have included:

Vocational Training for the Pulp and Paper Industry. Bulletin 168.

The Status of Vocational Teacher Training in the Industrial Field. Bulletin 176.

The Development of Social Intelligence Through Part-time Education. Bulletin 176.

Apprenticeship in England, France, and Germany, a publication composed of reports made available through the Department of State.

One bulletin and several miscellaneous publications were issued by the Home Economics Service, as follows:

The Home Project in Homemaking Education. Bulletin 170.

Report of Committee on Training for Publicity. Miscellaneous 1484.

Outcomes from Instructions in Homemaking. Miscellaneous 1496.

Home Economics Content That Is Effective. Miscellaneous 1497.

Homemaking Education in Relation to Recovery. Miscellaneous 1512.

Description of Home Project Material for Use as Case Studies. Miscellaneous 1524.

Summary of the Educational Program in Homemaking in the Central Region. Miscellaneous 1532.

Securing and Interpreting Facts Regarding Family and Community Conditions Relative to Foods. Miscellaneous 1543.

Management of a Play School. Miscellaneous 1544.

Suggestions to Home Economics Teachers of High School and Adult Classes on Education of the Consumer Buyers. Miscellaneous 1550.

Vocational rehabilitation publications have included:

Office Procedure in Vocational Rehabilitation. Bulletin 171.
Manual for Case Workers. Bulletin 175.
Vocational Rehabilitation. Miscellaneous 1473.

In addition preliminary drafts of studies made in several of the different fields listed under "Research" have been prepared.

APPROPRIATIONS 1934 AND 1935

Table 1 shows vocational education and vocational rehabilitation appropriations for allotment to the States and Territories for the fiscal years 1934 and 1935, and table 2, allotments to the States under the several acts providing Federal funds for 1934.

The increases in appropriations shown for 1935 over 1934 represent in the case of the Smith-Hughes funds a restoration of these appropriations to the basic appropriations made in the Vocational Education Act of 1917. This act provides permanent and continuing appropriations for cooperative vocational education in agriculture, trades and industries, and home economics, and teacher training, which increased to a maximum of $7,167,000, for 1926 and annually thereafter. The appropriations as provided in the act were made available each year from 1918 to 1932, inclusive. Under the Economy Act of June 30, 1932, the appropriations for 1933 were reduced by 10 percent, and this reduction was continued in 1934 under the acts of March 3 and March 20, 1933. Acting under authority of the act of March 20, 1933, the Bureau of the Budget further reduced these cooperative appropriations for 1934 by 15 percent of the portion estimated to be expended from the appropriations for salaries, and by 7.5 percent of a balance of the teacher-training appropriation.

The George-Reed Act of 1929 authorized additional appropriations for allotment to the States for vocational agriculture and home economics education of $500,000 for 1930 and for each year thereafter for 4 years an amount exceeding by $500,000 the appropriation of the preceding year. Under these provisions the following amounts were authorized: For 1930, $500,000; for 1931, $1,000,000; for 1932, $1,500,000; for 1933, $2,000,000; and for 1934, $2,500,000. These amounts were made available to the States in the appropriations for 1930, 1931, and 1932. For 1933 the appropriation was continued in the same amount as for 1932. The appropriation for 1934 was continued in the same amount as for 1933, subject to the 15 percent reduction under the act of March 20, 1933.

The period of the George-Reed Act expired June 30, 1934, and in the George-Ellzey Act Congress authorized appropriations annually for the 3 years 1935, 1936, and 1937 in the amounts shown in table 2. The full amount authorized was appropriated for 1935.

Appropriations for Hawaii, Puerto Rico, and the District of Columbia, which had been reduced in 1934 under the economy and other acts, were restored for 1935 to the amounts authorized in the original acts.

Appropriations for administration of the acts, and for research and service to aid the States in developing their vocational education and vocational rehabilitation programs were in the following amounts for 1934 and 1935:

	1934	1935
Smith-Hughes Act	$175,000	$180,000
George-Reed Act	68,000	----------
George-Ellzey Act	----------	60,000
Rehabilitation Act	55,000	58,000

TABLE 1.—*Appropriations for allotment to the States and Territories for vocational education and vocational rehabilitation: Years ending June 30, 1934 and 1935*

Appropriation	1934	1935
SMITH-HUGHES ACT		
Total	$5,940,000.00	$7,167,000.00
Vocational agriculture	2,520,000.00	3,027,000.00
Vocational trade, industry, and home economics	2,510,000.00	3,050,000.00
Vocational teacher training	910,000.00	1,090,000.00
GEORGE-REED ACT		
Total	1,275,000.00	----------
Vocational agriculture	637,500.00	----------
Vocational home economics	637,500.00	----------
GEORGE-ELLZEY ACT		
Total	----------	3,084,603.00
Vocational agriculture	----------	1,031,019.75
Vocational trade and industry	----------	1,032,191.60
Vocational home economics	----------	1,021,391.65
Vocational Rehabilitation Act	969,000.00	1,097,000.00
Hawaii	25,700.00	30,000.00
Puerto Rico	84,000.00	105,000.00
District of Columbia	11,000.00	15,000.00

TABLE 2.—*Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation. Year ended June 30, 1934*

State or Territory	Smith-Hughes Act [1]				George-Reed Act [2]			Vocational Rehabilitation Act [3]
	Total	Vocational agricultural education	Vocational trade, industrial and home economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational home economics education	
Total	[4] $5,940,000.00	[4] $2,520,000.00	[4] $2,510,000.00	[4] $910,000.00	$1,275,000.00	$637,500.00	$637,500.00	$969,000.00
Alabama	133,411.27	88,499.13	26,843.84	18,068.30	50,333.18	27,896.78	22,436.40	19,258.78
Arizona	29,875.65	13,294.45	8,231.49	8,349.71	5,430.92	2,060.50	3,370.42	8,840.00
Arkansas	94,945.46	68,473.92	13,809.34	12,662.20	40,660.31	23,300.73	17,359.58	13,496.50
California	259,394.86	70,570.15	150,061.04	38,763.67	30,806.35	12,915.33	17,891.02	41,317.71
Colorado	51,105.71	24,005.31	18,750.69	8,349.71	11,972.66	5,886.81	6,085.85	8,840.00
Connecticut	73,899.53	22,107.99	40,819.77	10,971.77	7,410.89	1,806.05	5,604.84	11,694.67
Delaware	24,928.74	8,347.54	8,231.49	8,349.71	2,327.82	968.48	1,359.34	8,840.00
Florida	70,391.33	32,963.48	27,403.06	10,024.79	14,163.70	5,806.76	8,356.94	10,685.30
Georgia	145,822.65	93,665.79	32,297.89	19,858.97	53,271.47	29,525.22	23,746.25	21,167.43
Idaho	31,262.62	14,681.42	8,231.49	8,349.71	7,642.71	3,920.66	3,722.05	8,840.00
Illinois	348,190.40	92,824.21	203,264.89	52,101.30	44,331.45	20,798.56	23,532.89	55,534.12
Indiana	154,009.82	67,124.87	64,772.79	22,112.16	33,939.65	16,922.08	17,017.57	23,569.07
Iowa	121,598.15	69,406.52	35,320.32	16,871.31	37,950.34	20,354.32	17,596.02	17,982.92
Kansas	92,730.18	53,563.85	26,323.07	12,843.26	28,299.27	14,719.71	13,579.56	13,689.47
Kentucky	131,149.14	84,478.37	28,818.63	17,852.14	45,905.44	24,488.39	21,417.05	19,028.37
Louisiana	103,415.65	59,003.04	30,063.16	14,349.45	32,246.90	17,288.39	14,958.51	15,294.90
Maine	42,090.01	22,144.48	11,595.82	8,349.71	9,173.21	3,559.12	5,614.09	8,840.00
Maryland	76,855.01	30,554.33	35,160.80	11,139.88	12,688.62	4,942.45	7,746.17	11,873.87
Massachusetts	186,663.05	19,458.34	138,188.80	29,015.91	7,498.55	2,565.45	4,933.10	30,927.70
Michigan	223,827.51	71,668.03	119,096.60	33,062.88	34,454.25	16,284.90	18,169.35	35,241.31
Minnesota	123,649.10	60,784.02	45,358.69	17,506.39	34,045.99	18,635.96	15,410.03	18,659.85
Mississippi	103,694.71	77,750.49	12,221.37	13,722.85	48,077.86	28,366.47	19,711.39	14,627.01
Missouri	174,204.01	82,369.86	67,053.22	24,780.93	44,079.58	23,197.08	20,882.50	26,413.68
Montana	33,172.44	16,591.24	8,231.49	8,349.71	8,464.69	4,258.46	4,206.23	8,840.00
Nebraska	68,439.28	41,498.17	17,532.52	9,408.59	22,711.55	12,190.89	10,520.66	10,028.49
Nevada	24,928.74	8,347.54	8,231.49	8,349.71	1,009.81	342.21	667.60	8,840.00
New Hampshire	27,142.65	8,943.74	9,849.20	8,349.71	3,575.60	1,308.17	2,267.43	8,840.00

[1] Appropriations for allotment for 1933 were reduced by 10 percent below the basic appropriations provided in the Smith-Hughes Act. Appropriations for allotment for 1934 were reduced below the 1933 appropriations by the Director of the Bureau of the Budget, under the Act of Mar. 20, 1933.

[2] The amount originally authorized for 1934 under the George-Reed Act was $2,500,000, but this authorization was automatically reduced to $2,000,000 by reduction of the appropriation for 1933 below the authorization for 1933. The amount appropriated for 1934 was $1,275,000 as shown in the table.

[3] The Independent Offices Appropriation Act, 1934, appropriated $969,000 for vocational rehabilitation and provided that the minimum allotment to any State for the fiscal year 1934 should be $8,840.

[4] The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

TABLE 2.—*Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation. Year ended June 30, 1934*—Continued

State or Territory	Smith-Hughes Act				George-Reed Act			Vocational Rehabilitation Act
	Total	Vocational agricultural education	Vocational trade, industrial and home economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational home economics education	
New Jersey	$180,699.32	$32,668.34	$120,437.18	$27,593.80	$11,010.77	$2,728.66	$8,282.11	$29,411.89
New Mexico	31,308.03	14,726.83	8,231.49	8,349.71	7,035.34	3,301.78	3,733.56	8,840.00
New York	561,583.86	96,136.54	379,497.33	85,949.99	39,357.38	14,984.74	24,372.64	91,613.01
North Carolina	160,686.29	109,831.06	29,208.92	21,646.31	61,145.49	33,301.00	27,844.49	23,072.53
North Dakota	42,988.86	26,407.66	8,231.49	8,349.71	14,964.25	8,269.35	6,694.90	8,840.00
Ohio	307,494.29	99,543.10	162,568.25	45,382.94	46,325.82	21,089.54	25,236.28	48,373.11
Oklahoma	119,250.76	73,255.12	29,635.73	16,359.91	39,886.91	21,315.19	18,571.72	17,437.82
Oregon	47,605.32	21,591.84	17,663.77	8,349.71	10,129.44	4,655.45	5,473.99	8,840.00
Pennsylvania	445,550.12	144,142.84	235,645.44	65,761.84	54,374.64	17,831.39	36,543.25	70,094.72
Rhode Island	39,615.40	8,347.54	22,918.15	8,349.71	957.17	342.96	614.21	8,840.00
South Carolina	88,894.48	63,638.56	13,383.82	11,872.10	35,209.31	19,075.60	16,133.71	12,654.33
South Dakota	42,728.43	26,147.23	8,231.49	8,349.71	14,750.67	8,121.80	6,628.87	8,840.00
Tennessee	130,233.83	80,032.65	32,335.61	17,865.57	45,588.61	25,298.65	20,289.96	19,042.68
Texas	285,795.68	159,848.05	86,177.09	39,770.54	89,485.48	48,960.63	40,524.85	42,390.91
Utah	29,194.00	11,240.89	9,603.40	8,349.71	5,258.27	2,408.47	2,849.80	8,840.00
Vermont	27,787.75	11,206.55	8,231.49	8,349.71	5,191.11	2,350.01	2,841.10	8,840.00
Virginia	121,006.15	76,137.89	28,332.12	16,536.14	39,091.80	19,789.24	19,302.56	17,625.67
Washington	74,164.85	31,587.30	31,902.85	10,674.70	14,350.90	6,342.85	8,008.05	11,378.03
West Virginia	87,124.39	57,590.39	17,727.17	11,806.83	23,948.32	9,347.94	14,600.38	12,584.75
Wisconsin	140,561.78	64,451.80	56,042.76	20,067.22	34,678.31	18,338.42	16,339.89	21,389.40
Wyoming	24,928.74	8,347.54	8,231.49	8,349.71	3,356.56	1,522.60	1,833.96	8,840.00
Alaska					678.14	71.35	606.79	
Hawaii [4]	25,700.00	8,500.00	8,500.00	8,700.00	5,752.54	3,742.45	2,010.09	
Puerto Rico [4]	84,000.00	24,000.00	[5] 48,000.00	12,000.00				

[4] The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.
[5] Trade and industrial education, $24,000; home economics education, $24,000.

GENERAL EDUCATION BOARD

REPORT OF THE TREASURER

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1934, principal fund, belonging without restriction to the Board, amounted to $45,664,670.50. This fund is invested in stocks and bonds. In addition the sum of $10,847,681.41 is reserved to pay appropriations to various educational institutions. This fund is also invested in stocks and bonds. Lapses and refunds on prior years' appropriations amounted to $2,896,003.75 and $526.60 respectively. The sum of $2,634,655.06 was paid during the year ended June 30, 1934.

Appropriations from income during the year aggregated $3,028,-723.93. Lapses on account of prior years' appropriations amounted to $1,214,971.55, however, leaving a net increase in income appropriations of $1,813,752.38.

The income from the above funds, together with income from undisbursed income (and including the sum of $252.19 received on account of income from the estate of Lucy M. Spelman) amounted during the year to $2,498,252.79. The balance of income from the previous year as of June 30, 1933, amounting to $11,955,984.86, together with sundry refunds amounting to $19.85, increased the total to $14,454,257.50.

Disbursements from income during the year were as follows:

WHITES

Colleges of liberal arts: General endowment, buildings and other purposes		$159,673.72
Science of education:		
Schools of education	$83,885.22	
Special projects	325,663.56	
		409,548.78
Natural sciences		57,455.17
Social sciences		9,187.86

WHITES—continued

Medical sciences:			
Schools of medicine	$250, 763. 18		
Special projects	18, 563. 85		
		$269, 327. 03	
Humanities		187, 511. 19	
Industrial art		905. 35	
Public education:			
Fellowships	$26, 522. 73		
Special divisions in State departments of education	188, 208. 72		
Teacher training	128, 496. 76		
Library training	37, 035. 16		
Studies	16, 091. 26		
Other purposes	11, 615. 38		
		407, 970. 01	
Miscellaneous		33, 428. 09	
General education		150, 070. 43	
Child growth and development		90, 412. 23	
Training of personnel for the advancement of knowledge		15, 410. 95	
			$1, 790, 900. 81

NEGROES

Colleges and schools: General endowment, buildings and other purposes		$480, 800. 74	
Natural sciences		10, 407. 19	
Social sciences		10, 000. 00	
Medical sciences:			
Schools of medicine	$205, 274. 78		
Special projects	6, 043. 49		
		211, 318. 27	
Public education:			
Summer schools	5, 948. 72		
Anna T. Jeanes foundation	40, 000. 00		
John F. Slater fund	37, 500. 00		
Rural school agents	123, 664. 22		
Fellowships	54, 451. 83		
Special divisions in State departments of education	3, 000. 00		
Teacher training	3, 000. 00		
Other purposes	7, 641. 38		
		275, 206. 15	
Miscellaneous		7, 272. 16	
			995, 004. 51
Surveys and studies			5, 800. 35
Miscellaneous projects			7, 505. 19
Administration			320, 114. 20
			3, 119, 325. 06

This leaves an undisbursed balance of income on June 30, 1934, of $11,334,932.44, which is invested as follows: Securities, $7,278,453.47; certificates of deposit, $1,500,000; cash on deposit, $2,280,842.57; and

accounts receivable, net $275,636.40. It should be noted, however, that against this balance of $11,334,932.44 there are unpaid appropriations amounting to $8,202,675.97, leaving unappropriated income amounting to $3,132,256.47.

The Anna T. Jeanes fund, the principal and income of which are to be used for Negro rural schools, amounted, on June 30, 1934, to $157,744.16. This sum is invested as follows: Bonds, $82,839.16; stocks, $16,645; and cash on deposit, $58,260. During the year the sum of $26,750 was appropriated from principal, which added to the balance unpaid June 30, 1933, totaled $31,740. Payments during the year amounted to $28,742.50, leaving $2,997.50 available for unpaid appropriations.

The income from this fund during the year was $5,329.14. Added to the balance from previous year, the total available income amounted to $8,627.46. The sum of $2,619.69 was paid, leaving $6,007.77 accounted for in cash on deposit. There were no unpaid appropriations from income outstanding June 30, 1934, therefore this sum was available for appropriation.

BUREAU OF MINES

SCOTT TURNER, Director

FINANCES

The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1934, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were $1,885,586.04. Of this amount $1,481,111.98 was spent, leaving an unexpended balance of $404,474.06. Owing to uncompleted work in the helium program for the Army and Navy there was a carry-over of $53,895.04 of helium-plant funds of which $50,000 was reappropriated for the fiscal year 1935.

On the regular work of the Bureau $1,254,695.90 was expended; this figure is subject to slight corrections due to unpaid obligations.

In addition, for the helium program, which is purely service work for the Army and Navy and has no part in the regular plans of the Bureau, $237,056.04 was appropriated directly to the Bureau, and $64,000 was transferred from the Army and Navy for the purchase at cost of helium produced by the Bureau for national defense. Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910.

TABLE 1.—*Bureau of Mines appropriations and expenditures, fiscal years ended June 30, 1911–34*

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments [1]	Funds transferred from other agencies [2]	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items [3]
1911	$502,200.00	$34,200.00		$536,400.00	$22,818.27	$513,581.73	$513,581.73
1912	475,500.00	45,640.00		521,140.00	6,239.77	514,900.23	514,900.23
1913	583,100.00	47,850.00		630,950.00	4,087.20	626,862.80	626,862.80
1914	664,000.00	57,307.79		721,307.79	4,678.29	716,629.50	716,629.50
1915	730,500.00	55,424.60		785,924.60	4,178.11	781,746.49	781,746.49
1916	757,300.00	48,710.87		806,010.87	9,058.63	796,952.24	796,952.24
1917	981,060.00	52,400.00		1,033,460.00	48,588.10	984,871.90	984,871.90
1918	1,467,070.00	51,901.98	[4] $3,062,000.00	4,580,971.98	395,745.10	4,185,226.88	1,172,939.64
1919	[5] 3,245,285.00	49,542.86	[6] 8,600,000.00	11,894,827.86	2,452,236.78	9,442,591.08	1,137,471.37
1920	1,216,897.00	52,800.00		1,269,697.00	9,592.18	1,260,104.82	1,245,891.36
1921	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923	1,580,900.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928	3,025,150.00	113,266.45	328,000.00	3,466,416.45	[7] 736,235.62	2,730,180.83	1,997,270.66
1929	2,725,118.00	103,000.00	205,500.00	[7] 3,753,094.67	[8] 152,701.34	3,600,393.33	2,280,960.68
1930	2,274,670.00	123,300.00	166,200.00	[8] 2,684,386.38	[9] 135,714.93	2,548,671.45	2,216,995.72
1931	2,745,060.00	120,680.91	166,500.00	[9] 3,134,595.10	[10] 195,534.37	2,939,060.73	2,304,121.45
1932	2,278,765.00	137,866.48	194,500.00	[10] 2,770,712.18	[11] 344,689.43	2,426,022.75	2,186,799.92
1933	1,860,325.00	75,100.00	221,808.42	[11] 2,398,947.38	[12] 491,052.22	1,907,895.16	1,710,762.02
1934	1,574,300.00	50,230.00	77,000.00	[12] 1,885,586.04	[13] 404,474.06	1,481,111.98	1,254,695.90
Total	39,126,779.00	1,696,328.35	15,387,315.43	57,737,820.72	5,714,281.52	52,023,539.20	34,550,786.33
1935	[14] 1,258,877.00	50,000.00	127,000.00	[13] 1,485,877.00			[15] 1,308,877.00

[1] Includes printing and binding, stationery, and contingent funds.
[2] Includes proceeds from sales of residue gas.
[3] Service items include Government fuel yards, helium, and other investigations and services for other departments.
[4] Includes gas investigations for War Department.
[5] Includes $1,586,388 for Government fuel yards.
[6] Includes War Minerals Relief Commission $8,500,000.
[7] Includes $719,476.67 unexpended balance reappropriated.
[8] Includes $120,216.38 unexpended balance reappropriated.
[9] Includes $102,354.19 unexpended balance reappropriated.
[10] Includes $159,580.70 unexpended balance reappropriated.
[11] Includes $214,713.96 unexpended balance reappropriated.
[12] Includes $184,056.04 unexpended balance reappropriated.
[13] Includes $50,000 unexpended balance reappropriated.
[14] Includes 5 percent salary restoration.
[15] Estimated.

A statement of the distribution of congressional appropriations to the branches and divisions within the Bureau and the expenditures of these funds in 1934 by the various divisions of the Bureau is given in table 2.

TABLE 2.—*Bureau of Mines expenditures, fiscal year 1934*

Branch or division	General expenses	Operating rescue cars and stations and investigation of accidents	Mining investigations in Alaska	Testing fuel	Mineral mining investigations	Oil and gas investigations	Expenses, mining experiment stations	Care, etc., buildings and grounds, Pittsburgh, Pa.
Office of the Director	$10,572.95							
Office of the Assistant to the Director	7,896.65							
Administrative Branch:								
Office-Administration Division	23,105.34	$18,559.67		$310.46	$1,279.09	$880.38		
Information Division	6,286.25	11,920.23	$539.58	5,681.75	4,964.53	6,592.63	$7,500.25	$2,387.03
Total	29,391.59	30,479.90	539.58	5,992.21	6,243.62	7,473.01	7,500.25	2,387.03
Office of Chief Mining Engineer		23,429.67						
Technologic Branch:								
Experiment-Stations Division		110,981.58		50,533.46	2,002.99		55,348.61	54,849.37
Explosives Division		27,755.28						
Mechanical Division		33,432.97	5,615.09	40,762.19				
Metallurgical Division					35,336.28		64,180.28	
Mining Division		3,918.86			41,737.75			
Petroleum and Natural-Gas Division						104,210.44		
Total		176,088.69	5,615.09	91,295.65	79,077.02	104,210.44	119,528.89	54,849.37
Economics Branch:								
Coal Division								
Common-Metals Division								
Mineral-Statistics Division								
Office of Principal Mineralogist								
Petroleum-Economics Division								
Rare-Metals and Nonmetals Division								
Total								
Health and Safety Branch:								
Demographical Division		19,645.49						
Safety Division		211,874.26						
Total		231,519.75						
Total appropriations	64,500.00	614,000.00	8,300.00	131,000.00	115,000.00	150,000.00	171,000.00	60,000.00
Total expenditures	47,861.19	461,518.01	6,154.67	97,287.86	85,320.64	111,683.45	127,029.14	57,236.42
Unexpended balances	16,638.81	152,481.99	2,145.33	33,712.14	29,679.36	38,316.55	43,970.86	2,763.58

TABLE 2.—*Bureau of Mines expenditures, fiscal year 1934*—Continued

Branch or division	Helium investigations	Economics of mineral industries	Helium plants	Helium production	Gas production	Printing and binding	Department contingent	Total
Office of the Director								$10,572.95
Office of the Assistant to the Director								7,896.65
Administrative Branch:								
Office-Administration Division		$9,441.90		$3,804.70		$5,156.05	$13,230.00	75,767.59
Information Division	$1,786.85	10,543.61				537.07		58,739.80
Total	1,786.85	19,985.51		3,804.70		5,693.12	13,230.00	134,507.39
Office of Chief Mining Engineer								23,429.67
Technologic Branch:								
Experiment-Stations Division						20.28		273,736.29
Explosives Division								27,755.28
Mechanical Division						616.87		80,427.12
Metallurgical Division						775.34		100,291.90
Mining Division						741.39		46,398.00
Petroleum and Natural-Gas Division	27,618.56		$130,161.00	57,359.18	$5,685.79	1,878.24		326,913.21
Total	27,618.56		130,161.00	57,359.18	5,685.79	4,032.12		855,521.80
Economics Branch:								
Coal Division		44,056.47						44,056.47
Common-Metals Division		17,233.39						17,233.39
Mineral-Statistics Division		77,118.93				21,992.44		99,111.37
Office of Principal Mineralogist		6,022.93						6,022.93
Petroleum-Economics Division		24,996.60						24,996.60
Rare-Metals and Nonmetals Division		20,960.69						20,960.69
Total		190,389.01				21,992.44		212,381.45
Health and Safety Branch:								
Demographical Division						2,730.63		22,376.12
Safety Division						2,551.69		214,425.95
Total						5,282.32		236,802.07
Total appropriations	40,000.00	220,500.00	184,056.04	64,000.00	13,000.00	37,000.00	13,230.00	1,885,586.04
Total expenditures	29,405.41	210,374.52	130,161.00	61,163.88	5,685.79	37,000.00	13,230.00	1,481,111.98
Unexpended balances	10,594.59	10,125.48	53,895.04	2,836.12	7,314.21			404,474.06

ORGANIZATION

It is the province of the Bureau of Mines to study methods of producing, treating, and utilizing ores, mineral oils, gases, and other mineral substances. The purpose is to reduce or prevent waste in the mining, quarrying, metallurgical, and other mineral industries, to conserve the country's resources, and to safeguard the health and lives of miners. The Bureau is specially charged to study the causes of mine accidents and the means of preventing them; to conduct research in the use of coal, oil, and other fuels; and to make economic studies of the various mineral industries. Investigation of the causes and prevention of mine accidents includes research on explosives and tests of mechanical equipment used in mines and quarries, while economic studies include compilation of statistics on the production and consumption of minerals.

The Bureau is essentially a field organization, with administrative headquarters in Washington and with experiment stations and field offices in the several mining and oil-producing regions of the country. It is organized in four branches—Technologic, Health and Safety, Economics, and Administrative.

Technologic work.—The Technologic Branch, which conducts most of the research investigations other than those pertaining to safety and health, consists of six divisions; Mechanical, Mining, Metallurgical, Petroleum and Natural Gas, Experiment Stations, and Explosives.

The Mechanical Division is charged particularly with the study of problems of fuel utilization and investigations dealing with mining machinery, especially electrical equipment used in mining. The Mining Division gives attention to problems of economy and efficiency in mining, and the prevention of accidents. The Metallurgical Division deals with problems of efficiency in the treatment of ferrous and nonferrous metals. The Petroleum and Natural-Gas Division is concerned with the production, transportation, treatment, and utilization of these products. The Experiment-Stations Division administers the 11 experiment stations (at Pittsburgh, Pa.; New Brunswick, N.J.; Minneapolis, Minn.; Tuscaloosa, Ala.; Rolla, Mo.; Bartlesville, Okla.; Reno, Nev.; Salt Lake City, Utah; Tucson, Ariz.; Berkeley, Calif.; and Seattle, Wash.), where most of the research investigations of the Bureau are conducted. Each station gives special attention to the problems of the mineral industries of the adjacent regions. The Explosives Division studies the safe use of explosives in mining, with particular emphasis on "permissible explosives."

Economics in mining and marketing of minerals.—The Economics Branch, which was established on January 1, 1926, conducts studies dealing with economic conditions and problems, as distinguished from scientific and technologic problems of the mineral industries.

The branch comprises 5 divisions: Coal, Mineral Statistics, Petroleum Economics, Rare Metals and Nonmetals, and Common Metals. These divisions collect, analyze, and publish data relating to economics of various mineral commodities.

Health and safety work.—The Health and Safety Branch investigates hazards affecting the health and safety of workers in the mineral industries and includes the Health, Safety, and Demographical divisons. The work of the Health Division, which was chiefly investigative and concerned physical conditions affecting the health of workers, was recessed during the fiscal year 1934 because of lack of funds. The major activity of the Safety Division is instruction in mine safety and accident prevention and in mine rescue and recovery work; investigations include studies of causes of accidents and methods of prevention. The Demographical Division collects statistics covering accidents in the mining and metallurgical industries and the production of explosives.

Administrative Branch.—The Administrative Branch is composed of the Office-Administration Division and the Information Division; the chief of the branch also acts as assistant to the Director of the Bureau. The Office-Administration Division handles general routine business of the Bureau under the supervision of the chief clerk, and is composed of accounts, personnel, clerical assignment, legal, multigraphing, mails and files, and property sections. The Information Division edits and supervises the publication of results of Bureau investigations, answers inquiries regarding the work or publications of the Bureau, and is responsible for motion-picture production and distribution. It is composed of the publications, editorial, motion-picture production, library, and graphic sections.

TECHNOLOGIC BRANCH

MECHANICAL DIVISION

Electrical section.—A supplementary testing station was established at Roslyn, Wash., and operated for a time to determine the permissibility of certain electrical equipment used in coal mines in that State.

Cooperation with the Underwriters' Laboratories regarding requirements of the two organizations for approval of devices was completed. A single schedule would require additional refinements not thought necessary for mining machinery.

Thirty-seven new designs of electrical equipment met the Bureau's requirements, 110 approvals previously granted were extended to cover changes in design, and three trailing cables were tested and listed as "specially recommended." The maintenance of permissible electrical equipment in a safe condition was studied in six mines.

Use of fuels.—A bulletin was published giving quantitative experimental data on the principles of underfeed combustion, which were so illustrated and expressed for the first time. The report furnishes rational information for use in the design of stokers using the underfeed principle.

The removal of ash as a fluid from furnaces using powdered coal requires knowledge of the fluid properties of the complex slags produced. The results of 5 years of study on the subject were presented to the American Society of Mechanical Engineers; they were highly commended as promoting this method of ash disposal and thus enlarging the market for coals having the lower fusing temperature of ash.

Fuel-economy service.—The fuel-economy service for Government plants is a connecting link between the Bureau's fuel studies and the use of fuels by the Government and consists of fuel-efficiency tests, the selection of fuels, power-plant advice, equipment-acceptance tests, and general consulting service to many Government departments on fuel problems, all with the object of economy. Many thousands of dollars are saved the Government each year from this work. A Bureau fuel engineer served as chairman of the fuel committee of the Procurement Division, Treasury Department. The coal purchases, methods of award, and specifications used by the various agencies throughout the entire Government were studied. Standard analytical specification limits for different coal areas were developed. Many changes and recommendations were made which are being adopted rapidly by the various Departments.

Fuel inspection and coal analysis.—The most extensive and impartial body of information regarding the quality of American coal is gathered, compared, and compiled by the Bureau's Fuel Inspection Service. By the aid of this information Federal departments are helped to select their coal and advised as to the quality of coal shipped on their contracts. During 1934, the Bureau analyzed 6,066 samples of coal and coke bought on Government specifications, 1,134 samples incident to research work, and 171 miscellaneous samples. Fifty-four samples were collected at bituminous-mine tipples, 67 at anthracite breakers, and 17 at tidewater piers. The section acted in an advisory capacity in rewriting coal specifications for the entire Federal service.

Constitution of coal.—At the request of the Pennsylvania State Geological Survey the coal beds of the Brookville area, in western Pennsylvania, are being correlated by means of characteristic plant constituents shown by microscopic examination. The coals involved are the Lower Kittanning, Clarion Rider, Clarion, Brookville, Upper Mercer, and Lower Mercer.

The Bureau's continued cooperation with scientific associations during the past several years resulted in the development of a system

of classification of coal by rank based on fixed carbon and British thermal units. Coals are grouped according to their degree of metamorphism in the natural series from lignite to anthracite. This classification scheme, based on an intensive study of numerous American coals, was accepted as a tentative standard by the American Society for Testing Materials and will be presented to the American Standards Association for approval.

Carbonization and byproducts of coal.—A survey of the gas-, coke-, and byproduct-making properties of American coals, begun in 1929, was extended to cover five additional coals. A monograph covering the first 30 coals of the survey, giving complete tabular data on their carbonizing properties as well as their physical and chemical properties, was prepared.

A very small-scale laboratory method having some merit for evaluating the coke-, gas-, and byproduct-making properties of coals was devised.

A small-scale laboratory test was developed for obtaining information regarding the caking properties of coals. The method is an approximate measure of the amount of that material in coal which fuses and becomes plastic on heating.

Sections of high-volatile gas coal heated in an inert gas at various temperatures revealed through the microscope the initial stages of coke formation and the temperatures at which the several microscopically visible constituents of coal fuse and swell.

Physical chemistry.—Processes have been developed on a laboratory scale for producing acetylene from methane, the chief constituent of natural gas, and for producing gasoline and lubricating oil from ethylene, which is readily obtained by thermal decomposition of natural gas. An equation has been developed that permits calculation of the yields of acetylene from methane under any given set of conditions.

Calculation of thermodynamic functions of hydrocarbon gases has been applied to all available spectroscopic data for hydrocarbon gases and has given the most accurate values of heat capacities and free energies yet obtained.

By studying the mechanism of gas explosions a new theory of flame propagation was developed. The use of explosion data for calculating specific heats of gases at high temperatures was demonstrated. All these fundamental theories and energy relations in gas explosions shed light on the way explosions occur in mines and on means for their prevention.

Conclusions.—Since no fundamental data are available on the comparative carbonizing properties of American coals, such as those obtained by the Bureau of Mines-American Gas Association method, there is need for extending the survey to cover all coals of the country suitable for carbonizing purposes.

Future work should stress the effect of blending, washing, and weathering or mild oxidation on carbonizing properties. Continued and repeated requests by subdivisional code authorities and others for unprejudiced and reliable information on composition and properties of American coals indicate that the Bureau should conduct such work. Facilities are adequate, but the available personnel should be increased.

MINING DIVISION

Metal mining.—The study of metal mining and milling methods and costs, one of the principal problems of the Mining Division for several years, has resulted in an interchange of technical and cost data invaluable to mine operators. Individual papers have now been published on most of the large metal mines and mills in this country, as well as representative establishments in Canada, Mexico, and Cuba. Moreover, summary papers have been prepared on each of the mining methods and on certain primary mining and milling problems presenting technical developments and costs. Bulletins on gold-mining, mine-accounting, shaft-sinking, and underground scraper practice have been published, and bulletin manuscripts on lead-zinc, copper, tungsten, placer mining, mining copper concentrates, metal-mine ventilation, and use of airplanes in mining were completed. As these manuscripts could not be published due to lack of printing funds, abstracts for mimeographing have been made of the manuscripts except that on ventilation.

This year greater attention has been given to the problems of small-mine operators. There has been a growing demand for information on methods of exploration, mining and treatment costs, types of equipment, and plant costs for small operations. Field work on methods and costs of developing and equipping small mines was begun during the winter of 1933, and this direct field contact by Bureau engineers with the operators has already resulted in an interchange of technical details and costs among the small operators, causing less wasted effort and expenditure and more intelligent planning of operations. Certain outstanding examples of good practice were selected and papers prepared, describing their operations in detail. Eight have already been issued, and six are in course of editing and publication. A general summary of these field studies was completed and is being issued as Information Circular 6800. Of general interest to mine owners is Information Circular 6748, Essentials for a Preliminary Report on a Small Lode-Gold Mine or Prospect, with Notes on Sampling, and Information Circular 6774, Leasing System as Applied to Metal Mining, both of which were issued during the year.

The chapter on mercury was prepared for the Minerals Yearbook.

Nonmetal mining.—Information circulars giving operating costs and technical details of the mining methods used at one crushed-stone quarry and one underground limestone mine were issued during the year. The latter paper is of especial interest to engineers, as it describes the first attempt at mining limestone by caving methods for its value as stone only. A report was compiled which collects recent information on the mining, processing, grading, and uses of mica. Because operators in the nonmetallic field were unwilling to prepare papers without compensation, insufficient material was received to supply the data necessary for additional detailed studies of the various operating steps in nonmetallic mining. In consequence, the working plan of the section was altered and this phase left for future development when funds are available. Instead, attention was necessarily directed toward assembling available information in a series of papers dealing with the technical problems involved in mining and treating nonmetallic minerals, by commodities. Compilation of five parts of the third paper in the series on sand and gravel production, entitled "Excavation," was completed.

Plotting the location of the principal producing nonmetallic deposits on maps of the States was begun; separate maps are being made for related commodities. Such information is helpful in determining the relative importance of producing areas and as a guide in planning technologic studies. Owing to the transfer of section personnel this work was suspended temporarily.

Publications of the division are being cataloged and indexed to provide a cross reference for producers searching for comparative information on operating details concerning both metals and nonmetals. This work was also suspended temporarily due to lack of personnel.

The chapter on crushed and broken stone was prepared for the Minerals Yearbook.

Geophysics.—The geophysics section has contributed valuable improvements to seismic, magnetic, and resistivity methods of geophysical prospecting. Field work was performed with the magnetometer in determining the underlying geologic structure of Government helium properties in Texas and with the potentiometer in determining the depth of bedrock at the Grand Coulee Dam site in the State of Washington. Application of the magnetometer in outlining large magnetite-hematite deposits in Puerto Rico was also successfully demonstrated. Geophysical apparatus for measuring the vibration of ground due to nearby blasting operations was designed, contructed, and tested in the field with satisfactory results.

The abstracts of articles on geophysical prospecting, particularly those published in foreign countries, were issued each month; an information circular, Patents on Geophysical Prospecting Issued in

the United States, England, Canada, Germany, France, and Russia, was prepared for publication; and a technical paper, Induction Prospecting for Shallow Ore Deposits and Small Metallic Objects, will be issued soon.

Falls of roof and coal.—Owing to curtailment in appropriations, it was necessary to suspend the important and valuable studies of falls of roof and coal on July 15, 1933.

Ventilation.—Ventilation studies were continued in the anthracite region throughout the year, and two papers—one on the Glen Alden Coal Co. mines and the other on the Hudson Coal Co. mines—were completed. Many other mines in this field were visited, and much additional information was obtained. The ventilation problem in the anthracite mines is complicated, and where ventilation is not studied and planned systematically much power is wasted in the attempt to deliver fresh air to all the working places; moreover, the cost is excessive.

Conclusions.—The dissemination and analysis of technical data from all the principal mining districts in information circulars have been valuable services, particularly to large mine operators. Further field studies are necessary to complete manuscripts on the open-pit mining method, core-drilling methods and costs, methods and costs of mining iron ores, hoisting practice, mine drainage, and on a number of milling problems. For the present, however, efforts are to be continued to extend all possible service to the small mine operators.

METALLURGICAL DIVISION

New processes.—Four new processes have been carried to the stage of development where they are ready for industrial application. These are the natural-gas smelting of zinc ore and of iron ore, the explosion shattering of ore as a substitute for grinding, and the alternating-current magnetic separation of minerals. All of these processes, together with the related theoretical work, have been described briefly in a series of progress reports.

Metallurgical fundamentals.—The collation of existing data on high-temperature specific heats has been completed and published as Bulletin 371, Contributions to the Data on Theoretical Metallurgy: II, High-Temperature Specific-Heat Equations for Inorganic Substances.

The data on vapor pressures have also been compiled and prepared for publication.

Experimental work is under way on the thermodynamic constants of chromium compounds.

Metallurgy of copper.—In the field of copper metallurgy reduction in the staff has necessitated restricting investigations to a study of the

flash roasting of concentrates. One paper giving the results of this research was published during the year.

Metallurgy of lead and zinc.—The work on handling zinciferous charges in the lead blast furnace, which has been under way for the past 2 years, was completed and prepared for printing. Publication has been delayed for lack of funds.

Metallurgy of gold.—Methods for the recovery of gold have continued to have a great public interest, and the division has devoted considerable time to the study of methods for treating refractory ores.

Metallurgy of iron and steel.—Activities in the field of direct iron and steel have included a survey of iron-ore resources with respect to amenability to rigorous concentration, development of a new method for reducing iron ore by natural gas, direct production of wrought iron from ore and from sponge iron, and a comparison of the properties of total steel made from scrap and from sponge iron. Studies on the most efficient operation of the iron blast furnace have included research on the relative reducibility of natural ores, sinters, and briquets, as well as on the role of manganese in the desulphurization of pig iron.

Ore dressing.—Work on power consumption in ball milling has been continued, and the list of nonsulphide minerals which can be recovered by soap flotation increased substantially.

Special studies.—Investigations of the magnetic properties of minerals have progressed steadily; and in February the development of a new type of magnetic separator was announced in which separation was accomplished by repulsion, rather than attraction, of the magnetic mineral. Methods of using this separator have been described for the following ores: Chromite, ilmenite, hematite, magnetite, ferberite, heterogenite, pyrite, limonite, and pyrrhotite.

In the field of explosion shattering, perfecting a satisfactory valve for continuous operation has permitted actual cost studies of steam consumption to be made; it has been found possible to reduce the cost of steam to less than 5 cents per ton of —48-mesh dolomite produced from ½- to ¾-inch material with the laboratory machine. All indications are that a commercial machine will be much more economical in steam consumption.

Conclusions.—The results obtained during the year have demonstrated the value of fundamental studies of metallurgical processes in improving their usefulness and in developing new ones. The greatest need of the division is for supplies and personnel to expand these fundamental studies and develop new metallurgical procedure that will result therefrom.

PETROLEUM AND NATURAL-GAS DIVISION

Cooperative investigations.—The practical value of the Bureau's engineering studies in oil and gas fields, many of which are conducted

in cooperation with various States, associations, and other agencies, continued to be demonstrated during the year. The following typical requests for cooperative help are of interest.

(1) The Michigan Department of Conservation requested and received assistance in determining the economic value of the natural-gas reserves in that State.

(2) Gas operators in the Texas Panhandle requested a technical study of the practicability of returning natural gas, stripped of its gasoline content, to the producing formations. Enormous volumes of this gas are now wasted. An important element of the problem is whether the relations governing the flow of natural gas from the producing formations to the surface, discovered by Bureau engineers, apply also to gas injection.

(3) The Kansas State Board of Health sought assistance in devising a method for disposing of oil-field brines. The gravity of the problem is indicated by estimates that in one field 400 tons of chloride salts, a hazard to fresh-water supplies, are produced daily as brine.

(4) In cooperation with operators the Bureau studied the flow of wells and reservoir conditions in east Texas and Oklahoma fields. This work supplied data of a type not previously available, which have been used to improve operating practices and to conserve resources.

Production of oil and gas.—Continuing work on subsurface relations of oil and gas evolved better methods of determining the energy available from expansion of gas from natural-reservoir crude oil, augmenting findings reported in a paper on the solubility and liberation of gas from natural oil-gas solutions. Improved technic which will minimize waste should result from this information.

A preliminary report was published dealing with a laboratory investigation of the oxidation of crude oils by air used to stimulate production. In the experiments paraffin-base oil was affected less seriously by oxidation than naphthene- and intermediate-base oils.

The Bureau's methods of gaging and controlling gas wells, including wells treated with acid, were applied extensively, and a comprehensive report was prepared. A technical paper was issued describing a convenient method for measuring the viscosity of natural gases that is adequate for practical application.

Natural-gas transportation.—A report was published giving simplified formulas, curves, and charts to facilitate economical design of parallel pipe lines, which will prove especially useful where existing natural-gas transportation systems are to be augmented. Moreover, initial studies were made of solids, thought to be hydrocarbon hydrates, that form in natural-gas pipe lines.

Engineering field studies.—Water encroachment, remedial measures, and other producing-horizon problems were studied in Permian Basin fields of Texas and in the Oklahoma City field. A report soon

to be issued describes equipment used in the Oklahoma City area, the proving ground for improved and recently developed oil-field machinery. An engineering report was completed dealing with subsurface conditions in the Zwolle (La.) field and the use of acid in that area to stimulate production. The widespread treatment of wells with acid makes this report timely.

Special engineering problems.—Removal of mud sheaths from oil-sand faces is important, especially where formation pressures are low; otherwise, quantities of oil are trapped. A recent Bureau report describes a chemical method for removing mud sheaths by adding powdered limestone to the drilling mud. Later inhibited hydrochloric acid acts upon the calcium carbonate. The method is being applied in the field.

Two papers on evaporation losses were completed. One deals with the handling and transportation of petroleum and gasoline, the other with bulk-storage stations.

Data were given to the gas industry in a Bureau report on the corrosion of steel by gases containing traces of hydrogen sulphide, with particular reference to effects of pressure and moisture, representing the first authentic information on a type of corrosion that if uncontrolled may nesessitate large expenditures for replacement of equipment. A companion paper deals with the comparative resistance of certain commercial ferrous materials to gaseous hydrogen sulphide corrosion.

Chemistry and refining.—The removal of free sulphur from gasoline by lime and hydrogen sulphide was discussed in a report published in the technical press; another paper, describing a continuous laboratory topping apparatus developed in the Bartlesville Laboratory, was presented before a scientific society. Reports giving tabulated analytical data on all crude oils from Texas heretofore analyzed by the Bureau of Mines (298 samples) and detailed analyses of crude oils of the Louisiana Gulf coast area were submitted for publication. Curtailed funds prevented surveys of the characteristics of gasoline sold to the general public.

Helium section.—The Amarillo helium plant produced 6,534,270 cubic feet of helium for use by the Army and Navy in airships. The purity of the plant's output was better than 98.2 percent and recovery about 90 percent. Acquirement of the Cliffside reserve was completed, giving the Government control in fee of more than 50,000 acres, covering a closed geologic structure containing helium-bearing natural gas. The rock pressures of the wells indicate a depletion of only 2 percent of the gas reserve after producing 58,000,000 cubic feet of helium in 5 years of operation. Thus the Nation is assured a supply of helium for many years.

The Cryogenic Laboratory, formally opened by Mme. Marie Curie on May 21, 1921, continued research on the conservation, production, and purification of helium and other industrial gases. Several reports were published for the benefit of the industry. Such investigations have been important in reducing the cost of helium to a point thought impossible a few years ago. Although curtailed demand reduced the plant's output to less than half that of former years, total expenditures in plant and gas-field operation were less than $10.25 per thousand cubic feet of helium produced, and the Government's net operating cost, taking account of returns to the Treasury from the sale of residue gas, was only about $7.50 per thousand. Before the Amarillo plant was built helium cost $34 or more per thousand feet.

On recommendation of the Secretary of the Interior, the President set aside Helium Reserve No. 2 on public land in Utah. This reserve, although small, contains gas of high helium content and will be held for a national emergency.

Conclusions.—The Bureau's work on oil and gas has been crippled seriously. Curtailed appropriations caused termination of studies that had reached a point where definite results of practical value were assured. There is need for investigations of fluid-energy relations pertaining to optimum well spacing, performance of wells under controlled production, water encroachment, and economical withdrawal of oil and gas. Research into fractional distillation should be expanded to include methods of obtaining petroleum products without excessive refining costs.

Further unification and centralization of all production and refining studies will be made to place collected data in a form usable by industry. Construction of an engineering laboratory at the Petroleum Experiment Station, Bartlesville, Okla., would remove the handicaps of inadequate equipment and improper working conditions.

Funds should be supplied to drill 2 new wells and repair 3 wells on the Cliffside structure to protect the helium reserve from waste and assure an uninterrupted supply of gas. The helium-investigations appropriation should be restored, permitting necessary Cryogenic Laboratory studies and helium-bearing gas surveys to continue and thereby reduce operating costs and strengthen the national defense.

EXPERIMENT-STATIONS DIVISION

The Experiment-Stations Division has administrative control over and coordinates the work of the 11 experiment stations at which most of the technologic studies of the Bureau are conducted. In addition, the chief engineer of the division has technical supervision over the Bureau's research on nonmetallic minerals, coal preparation, coal chemistry, gas chemistry, and physical chemistry.

Nonmetallic minerals.—The most significant accomplishment in nonmetallic minerals research for the year has been the successful mechanical separation of sylvite (KCl) and halite (NaCl), hitherto regarded as impossible because of the close similarity in properties of these salts. In addition, the program of research to develop methods for extraction of potassium salts from polyhalite was virtually completed. The possibility of substituting domestic chalk and powdered limestone for imported products in the whiting industry has been proved.

Concentration of potash ores.—Starting with a sylvinite ore containing about 40 percent potassium chloride, the Mississippi Valley Experiment Station of the Bureau of Mines (at the Missouri School of Mines and Metallurgy, Rolla, Mo.), by classification and tabling or by jigging in brine solutions has recovered a product containing almost 88 percent potassium chloride. The mechanical separation of halite from sylvite, heretofore regarded as impossible, should provide a low-cost treatment process.

Recovery of potassium salts from polyhalite.—High recoveries and concentrations of potassium sulphate were obtained on a chemical engineering scale at the nonmetallic minerals experiment station, New Brunswick, N.J., in the continuous hot extraction of calcined polyhalite, a step essential to several processes. A new process for simultaneous utilization of polyhalite and sylvinite to produce potassium sulphate, a fertilizer ingredient now imported, was developed and tested on a laboratory scale.

Retarders for Portland cement.—Research at New Brunswick has shown that calcium hydroxide delays the hydration and set of tricalcium aluminate and retards the set of Portland cement. The retarding action is due to the formation of stable and insoluble hydrated tetracalcium aluminate at the surface of tricalcium aluminate and hindrance by the tetracalcium compound of metastable direct hydration of the aluminate to the tricalcium hydrate. Tricalcium silicate hydrolyzes with moderate rapidity to give calcium hydroxide. The retarding action of gypsum and other calcium compounds is due to formation of active calcium hydroxide.

Solubility of sodium sulphate.—The solubility relations of sodium sulphate in solutions containing a number of other sodium compounds have been determined at elevated temperatures at New Brunswick. These data are important in conditioning boiler water to prevent formation of scale and corrosion and in the recovery of sodium sulphate from natural or artifical brines.

Studies of whiting and chalk.—A study at the Northwest Experiment Station of the Bureau of Mines, Seattle, Wash., in cooperation with the State university, has shown that domestic chalks and powdered limestones can be used satisfactorily in putty, ceramics, rubber,

linoleum, and paints. The color of chalk was not improved appreciably, except by chemical precipitation.

Coal washing.—At Seattle comparison of flotation by mechanical agitation with the Elmore vacuum process under test conditions showed similar cleaning efficiencies, but less reagent and power were required by the vacuum process than by the agitation method.

As a result of Bureau of Mines studies at its Southern Experiment Station, Tuscaloosa, Ala. (in cooperation with the University of Alabama), on the washability of the Mary Lee coal bed, a plant erected by one company produced coal containing 8 percent ash, the lowest thus far produced commercially from this bed. Washability studies of fine slack coal from the Thompson and Woodstock beds were completed.

CHEMICAL AND PHYSICAL PROPERTIES OF COAL

Grindability of coal.—Due to the importance of powdered coal as an industrial fuel, a standard test that will measure the relative ease or difficulty with which various coals may be pulverized is an imperative need of the industry. The Northwest Experiment Station has studied the several methods already proposed for measuring grindability and has developed a test the Bureau believes to be superior to any other so far proposed.

GAS RESEARCH

Analyses of mine gases.—The Pittsburgh Experiment Station analyzed 1,222 gas samples, taken in mines and tunnels, for determining the cause of mine explosions, studying the extinguishing of mine fires, and improving ventilation in working places.

Warning agents for propane gases.—Materials were investigated that might prove suitable for imparting to propane, a comparatively odorless product of natural gases, properties making it perceptible to the senses to apprise persons of leakages that might create explosive hazards. The two most satisfactory substances found were ethyl mercaptan and refinery propane-propylene mixtures.

Inflammability of gases and vapors.—It was discovered that 50 to 70 parts by liquid volume of carbon tetrachloride rendered such materials as pentane, hexane, heptane, octane, gasoline, and solvent naphtha incapable of producing inflammable vapor-air mixtures. The inflammable limits of vapors of propylene dichloride, dioxan, and divinyl ether were determined. Studies of the causes of and remedies for underground explosions in manholes and sewers in Boston, Mass., have aided in decreasing the number of explosions and the attendant hazards to property and life.

Devices for respiratory protection.—A schedule of material and performance requirements for safe filter-type dust respirators has been

prepared. New approvals granted during the year include a mask for protection against hydrocyanic acid gas, a speaking diaphragm facepiece, and many extensions of approval to changes and improvements in hose masks.

Conclusions.—The foregoing accomplishments in nonmetallics research were achieved by a staff of 11 technical employees—6 at New Brunswick, 2 at Seattle, and 3 at Tuscaloosa—plus the part-time services of 2 men at Rolla for 3 months. The gas research was conducted by nine men. Considering the small staff, the output is large and represents a big return on the investment. Gravity methods have been applied successfully to the preparation of sylvite from its ore. Coal-cleaning research has led to the building of a new plant that produces the lowest-ash coal the particular bed has ever yielded. Contributions have been made to the treatment of fine coal. Domestic substitutes for imported whitings have been found. All will mean increased financial return for the domestic mineral industry.

Chemical agents to indicate the leakage of bottled gases have been developed. The inflammable limits of 3 vapors and the effect of carbon tetrachloride in inhibiting the inflammable properties of gases and vapors of 6 chemicals have been determined. Gas masks have been approved as to permissibility. A schedule was developed preparatory to undertaking similar approval of dust respirators. These activities have added to the safety with which workers in the industry may be employed and with which mineral products can be used.

If such significant progress can be made under the handicaps of the past year, it is obvious that still greater accomplishments can be expected if former appropriations are restored. In the field of nonmetallic minerals investigations the extension of research on the chemical and physical properties of fine particles in relation to their solution, dispersion, coagulation, and settling in various media is urgently needed (*a*) to reduce pollution of air by fly ash from power plants burning powdered coal, (*b*) to prevent stream pollution from coal-washery wastes, and (*c*) to collect finely divided minerals from slimes in metallurgical plants.

In gas research the fundamental investigations on ignition and propagation of gas explosions should be extended, since the results to be obtained have such wide applicability to safety. The origin and evolution of combustible and irrespirable gases in mines and tunnels, the relative hazards in underground use of various fuels for internal-combustion engines, the prevention and removal of dust, air conditioning, gas diffusion, and extinguishing of underground fires should be given intensive study.

EXPLOSIVES DIVISION

Permissible explosives.—The work of the Explosives Division was restricted to tests, in connection with the list of permissible explosives, which are promised as a service to industry in published schedules.

Summary.—All study of explosions and all research work in explosives was recessed. The division was operated without an explosives specialist as division chief. Forty-nine reports and 224 analyses were made and 8 articles published. The explosives work of the Bureau was at the lowest ebb in its history.

OFFICE OF CHIEF MINING ENGINEER

Experimental mine investigations.—At the request of the Leasing Division of the United States Geological Survey, tests were made of the compressibility and bearing strength of large specimens of potash salt taken from the mine of the United States Potash Co. at Carlsbad, N.Mex., operating under lease from the Government. These data are to furnish a basis for estimating the size of pillars required to support the mine roof. It was found that under load the salt acts as a plastic material, and time studies of compression were required. Tests of four specimens indicated that the mineral would support a load of 3,000 pounds per square inch indefinitely but would fail slowly at 4,000 pounds. Funds allotted for the fiscal year were insufficient to continue tests of the explosibility of coal dust, except for a few demonstrations for groups of mining men. The work was suspended at midyear to permit a threatening mine fire on adjacent property to be extinguished and repairs within and without the Experimental mine to proceed; both projects were made possible by allotment from the Civil Works and Public Works Administrations and occupied the balance of the year.

Laboratory dust-inflammability investigations.—Work of this type was limited, but test determinations of dust from airways of the Holland Tunnels between New York and New Jersey disclosed that it was highly inflammable and should be removed or treated.

Mine Safety Board.—The board held 18 formal meetings to consider questions submitted to it by the Director of the Bureau of Mines and to formulate more safety decisions. A summary of 25 approved decisions, with explanatory text, was prepared and published.

International cooperation on interchange of information on mine safety.—Cooperation with foreign government bureaus corresponding to the Bureau of Mines continued to function by the interchange of quarterly reports and correspondence on specific technical questions with the official testing stations of Belgium, France, Germany, and Great Britain. A report prepared by a member of the British Safety in Mines Research Board on work carried on during his year's detail at Pittsburgh, concerning further development of standard

laboratory methods for dust-inflammability testing, will be published by the Bureau.

Consulting duties.—The consulting duties of the chief mining engineer involved preparation of reports for the Director and division chiefs on questions of safety and special details; for example, at the request of operators a field investigation of "bumps" in coal mines in the Cumberland Mountains of Kentucky and Virginia was conducted.

Conclusions.—The results of the investigations have already led to saving thousands of miners from explosions of gas and dust. To continue the work adequately requires additional allotments.

ECONOMICS BRANCH

COAL DIVISION

Service to coal industry.—The Coal Division maintains an information service for producers, distributors, and consumers of coal which includes a series of current reports that follow the short-time movements of supply and demand and detailed annual reports that provide a background for the prompt, current service and trace the underlying economic changes in the industry.

A total of 31,550 individual services was rendered during the year by mail, telephone, or personal interview. This does not include distribution of regular publications to established mailing lists.

Speeding up of work.—The outstanding achievement of the year was the speeding up of the work and releasing the final annual figures much earlier than in previous years. The annual chapter on Coke in 1931 was delivered to the editor on January 5, 1933, Coke in 1932 on October 31, 1933, and Coke in 1933 on May 18, 1934. The annual chapter on Coal in 1931 was received from the printer on December 30, 1932 and Coal in 1932 on October 31, 1933. The final annual figures for 1932 were mimeographed and released to the public in advance of being delivered to the editor for publication, as has been the custom in the past. These mimeographed reports for 1932 were distributed much earlier than in previous years.

Special effort was made to release the reports earlier to comply with many requests from the N.R.A. During the past year the Coal Division prepared some 50 special tabulations for use of the N.R.A., in addition to furnishing all of the available published material on the coal and coke industries. The district code authorities also made many requests for information during the past year.

Economies in publication.—The policy of collecting statistical reports through trade agencies, which was expanded in the previous year to reduce costs, was continued in 1933–34. The cooperative arrangement with the National Association of Purchasing Agents for the col-

lection of current reports on coal stocks and consumption has proved to be very satisfactory and has been continued.

Large savings were made in publication costs by combining existing reports and condensing tables to make more efficient use of available space. Editions were reduced, and the cooperation of the national coal-trade associations in reprinting extra copies was obtained.

Special investigations.—Results of special investigations published during the year include a study of the movement of coal by truck. The record of advancement of mechanized mining in the anthracite industry was followed with care.

Effect of economy program.—Reduction in personnel at the beginning of the fiscal year resulting from the impounding of appropriated funds in connection with the economy program threatened the maintenance of a number of the division's statistical series, including current reports on coal stocks, consumption, and distribution and production by fields. Through the release of a portion of these funds by the Bureau of the Budget to enable the Bureau of Mines to preserve certain essential statistical services the division was able to continue publication of the reports named.

Conclusions.—Passage of the National Industrial Recovery Act taxed the facilities of the division to the limit to furnish data on the coal and coke industries. In addition to supplying information to the bituminous-coal code authority, the division has answered many requests for information from the Reconstruction Finance Corporation, the Public Works Administration, the Division of Subsistence Homesteads, the Federal Emergency Relief Administration, and the Tennessee Valley Authority. In all such work the division service is limited to finding and certifying the facts that may be established by the statistical record or derived immediately therefrom. Departure from its role as a fact-finding agency conducted in a spirit of independent scientific inquiry would impair public confidence in its findings.

Even though there is a large fund of information available in the Coal Division, it frequently happens that the division is unable to supply the data desired by the many newly established Government agencies. For illustration, the bituminous-coal code authority is in serious need of current data on production by code authority districts and current data on destination of shipments of coal by code authority districts. With additional funds and personnel the division could supply the code authority with this information.

Among the immediate needs to increase the efficiency of the service rendered by the division are provision for resumption of printing of such analytical tables and diagrams of the annual reports on coal, coke, and byproducts as it has been necessary to drop since 1930; for payment of the 20-percent surcharge for rapid service at the Government Printing Office to avoid present delays in the publication

of the division's annual reports; and for printing manuscripts on coal distribution, marketing, partings in coal seams and their effect on costs, and similar economic studies. The publication of many additional current data on supply and demand, competition of substitute fuels, etc., which should be made available to industry, would be possible also if additional funds were provided. The provision of funds for field trips to collect information for annual and other reports and to keep abreast of developments also would materially enhance the value of the division's service to industry and the public.

The following basic information of national scope is greatly needed by both producers and consumers of coal, in their mutual interest:

1. Annual detailed surveys of the distribution of coal from each producing to each consuming market. This information, collected in 1929, proved extremely useful and is now urgently needed to show changes under altered conditions in the industry.

2. Annual statistics of the domestic fuel market, involving the equivalent of 160,000,000 tons of coal, would assist the coal industry to hold its proper share of this market.

3. Current information on changes in production capacity would afford industry a guide to the probable effect of such changes on market conditions and possibly discourage unnecessary or unwise expansion.

4. Economics of byproduct recovery; studies of supply and present and potential demand for the many byproducts of coal processing.

MINERAL-STATISTICS DIVISION

Minerals Yearbook.—Publication of the new Minerals Yearbook 1932–33 early in September 1933 marked the greatest advance toward the early release of annual statistical and economic information on minerals achieved in more than a half century of Government effort in this field. The Minerals Yearbook 1932–33, comprising 61 chapters covering the principal metals, mineral fuels, and nonmetals, was issued relatively soon after the close of the year it covered and represented a gain of many months over the tardy appearance of previous annual volumes. The early availability of reliable annual statistics of minerals was particularly important in 1933 in connection with difficult economic problems affecting the mineral industries, because of the need for up-to-date information in code negotiations under the National Recovery Administration, and as a source of data required by various Government agencies concerned with emergency projects.

The manuscript for the Minerals Yearbook 1934, comprising 72 chapters, was submitted to the printer on June 15, 1934. This second volume of the Minerals Yearbook series includes many improvements that will enhance its reference value.

In addition to preparing about 60 chapters for the Minerals Yearbook, the division compiles statistics on world production of mineral commodities and cooperates with State geologists and mine inspectors in statistical studies. Field offices maintained at Denver, Colo., Salt Lake City, Utah, San Francisco, Calif., and Joplin, Mo., collect data and supply direct service to the mining industry. They also prepare for publication 14 annual reports covering metal mining in all important producing areas.

Current reports.—Data gathered in over 100 annual statistical surveys of metals and nonmetals are released in mimeographed form before the Yearbook is published. Monthly reports on cement production, shipments, stocks, foreign trade, and other related data are compiled regularly. Similar reports on the gypsum industry are issued quarterly. The reports of this division comprise the only information available on production and marketing problems of many mineral commodities.

Conclusions.—The services of the division were required frequently during the year to provide information both to mineral producers and to Federal agencies concerned with the economic problems resulting from the depression. In some instances specialists of the division were loaned the newer Government agencies. The statistics and information maintained by the division are the sole source of reliable official data for a large portion of the mineral industry.

Experience during the past year has shown that current statistical services should be inaugurated for many minerals, especially those utilized in the construction industry, and that additional information should be obtained in the annual canvasses to meet the demands of both industry and Government. This needed information can be made available by a moderate increase in the professional and clerical staff of the division.

PETROLEUM-ECONOMICS DIVISION

The work of the Petroleum-Economics Division during the fiscal year ended June 30, 1934 may be divided into two parts—the regular work done before August 19, 1933, the date on which the President signed the Petroleum Code, and the enlarged duties thereafter.

Routine and special work.—The present statistical reports of the division are the outgrowth of years of effort by specialists in the Bureau of Mines (since 1918) and the Geological Survey (prior to 1925). They are the official Government statistics on the petroleum industry; hence it was logical that when the Department of the Interior was named the Federal agency to administer the provisions of the code, the reports of the Bureau of Mines should supply the statistical background so important to any program of regulation. Where additional data were needed, as with interstate movements

and stocks of crude, arrangements were made whereby the necessary information was collected by the Bureau of Mines, with the assistance of certain Petroleum Administrative Board employees detailed for the purpose. Under this arrangement a series of monthly reports was initiated showing a break-down by States of crude runs to stills, crude stocks at refineries, interstate shipments of crude, and movements by the three common methods of transportation—pipe lines, tankers, and tank cars. This new report has supplied the basic data for consumer demand that are necessary to allocate the total allowable production equitably among the various producing States.

The new questionnaire for reporting crude-oil stocks in detailed form, which was prepared in cooperation with the Petroleum Administrative Board and the Planning and Coordination Committee, has been the basis of a new table showing stocks by location by States, which was included in the Monthly Petroleum Statement, beginning with August 1933. This new questionnaire stipulated that companies holding 100,000 barrels or over should make weekly reports of crude stocks by districts. These data, which cover about 98 percent of the total stocks, have been compiled by the Bureau of Mines and published by the Department every week since October 7. When used in conjunction with the weekly reports of production and crude runs to stills compiled by the American Petroleum Institute, they give a reasonably accurate picture of the current statistical position of the industry.

Annual reports.—The demands on the time of the division by the new Federal agency have necessarily been reflected in a slowing-down of the work on the annual and special reports of the division. The annual reports include chapters for the Minerals Yearbook on crude petroleum and petroleum products, natural gas, natural gasoline, carbon black, and asphalt and related bitumens. The special reports cover important phases of the industry, such as growth in refinery capacities, trends in refinery fuel consumption, sales of liquefied petroleum gases, and growth of pipe-line mileage and storage capacities. In spite of the additional work these reports, with one or two exceptions, are being prepared as usual, thus fulfilling the Bureau's obligation to maintain the basic statistics of the industry as in an unbroken series.

Conclusions.—The method used in computing the crude-oil allowables for August 1934 was revised from that previously used to provide for enough fuel-oil production to meet reasonable consumer demands. This fact alone justifies the recommendation that the Bureau be encouraged to obtain data on fuel-oil distribution similar to those compiled from 1926 to 1931. Further recommendations are that the division be given the authority and funds to compile data on natural-gas wastage and oil reserves.

RARE-METALS AND NONMETALS DIVISION

Summary of work.—Individual market and economic studies on more than 125 different mineral commodities are now available in publications prepared by the Rare-Metals and Nonmetals Division, and facilities for effective assistance to buyers and sellers of minerals have been created and maintained. Most of the commercially important commodities in the division's diversified field of activity have now been covered, and although general informational summaries on sundry other minerals and metals remain to be done this basic program has proceeded far enough to afford a foundation for intensive studies of individual industries and industrial groups and of their broader economic implications.

During the fiscal year a 60-percent reduction of the active personnel resulted in abandonment of minor objectives; but, notwithstanding the necessity of maintaining routine services and responding to specific inquiries for market and technical data, the division prepared 25 reports for publication by the Bureau and 25 articles for the technical press (exclusive of reprints and digests of Bureau publications). In addition, at the end of the year 15 reports were ready for Bureau publication and 1 article for outside publication. The division also supplied data to many authors of Minerals Yearbook chapters on rare metals and nonmetallic minerals that were not prepared by the division.

Advance estimates of domestic production.—Supplementing the annual production canvasses, which are rarely completed until several months after the close of the calendar year, and to assist those desiring to make long-term forecasts, the division has endeavored to develop a technique for estimating domestic production and other trade data from available barometers. Interim forecasts on such diversified items as barite, china clay, fire clay, phosphate rock, crushed stone, and sand and gravel and quarterly statements on gypsum consumption, by methods originated in this division, can now be made. With respect to phosphate rock, the estimate for 1933, which was available 3 months ahead of the final figures, was in error by only 1.75 percent. Intensive market studies on long-term trade trends in the lime industry and in the roofing-slate industry were completed during the fiscal year.

Summary study of volume and price data.—The tabulation and preliminary presentation of the basic factual data on the nonmetallic mineral industries have been completed in the form of a summary study of volume and price data. General indexes of productive activity and consumption, as well as prices in allied and barometric industries, are therein presented in parallel form to facilitate economic planning in connection with this group of industries, which hitherto

has escaped the attention of academic economic commentators. This report supplements an introductory report entitled "Economic Notes on the Nonmetallic Mineral Industries" and an information circular containing summary tables of the value of production of all nonmetallic minerals other than fuels and including thumbnail sketches of individual industries.

Conclusions.—During the last 5 years the division has built up a well-correlated mass of information and statistics on virtually all the rare metals and nonmetallic minerals. Meanwhile a technique for market analysis and economic service has been developed to assist in summarizing and marshaling these data into reports. For the near term the activities of the division will be restricted mainly to maintaining its status as the principal repository of information on the commodities in its field in responding to current inquiries from those seeking economic and technical information. Notwithstanding the fact that the momentum of previous activities has been largely dissipated, the essential factors for economic planning by industry and the Government are being maintained and facilities for effectively utilizing these stores of information may be speedily reconstructed. With fortified personnel the building-materials section, in particular, is prepared to take an active part in any program in connection with the upbuilding of the capital goods industries.

COMMON-METALS DIVISION

The mineral commodities in the field of this division are gold, silver, copper, lead, zinc, aluminum, tin, nickel, iron, manganese, chrome, sulphur, and pyrite. Economic aspects of most of these commodities assumed wide-spread national interest during the past year, and demands upon the division for statistical and other information regarding them increased accordingly.

Service work.—The changes in the value of the dollar and the fixing of the price of newly mined silver inspired studies on the status of the monetary metals, not only by the Treasury but by Members of Congress, banking and commercial interests, economists, and others. A large volume of inquiry on these metals was answered by this division or assisted by studies undertaken by the division. A paper was published concerning the effect of 64.64-cent silver upon the value of ores of base metals. Another was written upon the origin of the monetary use of metals.

Preparation of the codes of metal industries by the National Industrial Recovery Administration was guided largely by consideration of fundamental data concerning the several metals. The division pro-

vided various compilations required for this purpose; its specialists attended many code hearings and served at times as advisors to the deputy administrators concerned. Special services were rendered several other Government agencies, including the Federal Trade Commission.

Special studies.—Studies were conducted upon the following subjects, among others: Facilities, plant capacity, and ownership applying to the production of synthetic cryolite and fluorides; the power requirements for mining in the tri-State and southeastern Missouri mining districts; the cost of sulphur production; reserves of bauxite ore; sources of domestic silver with respect to various kinds of ores; the effect of relative price levels for lead and zinc upon the use of pigments made from them; the effect of low-cost copper upon domestic industry; the economic background of tin smelting in the United States; the use of ammonia-free zinc scrap for making zinc chloride; and the raw materials of sulphuric acid manufacture.

Conclusions.—The division also produced its usual quota of chapters for the Minerals Yearbook and of other routine papers and reports. On the whole, it met demands for service by the public and by other Government agencies more adequately than might have been expected in view of the severe curtailment of its personnel and the loss of time caused by moving twice during the year.

PRINCIPAL MINERAL TECHNOLOGIST

The principal mineral technologist handles specimens referred to the Bureau of Mines for determination, writes chapters entitled, "Molybdenum", "Tungsten", and "Radium, Uranium, and Vanadium" for the Minerals Yearbook, and makes special effort to keep abreast of the knowledge on these subjects. Work on commercial gases other than helium and those used for fuel has been begun. He is engaged in rewriting and enlarging A Glossary of Mining and Metallurgical Terms.

During the year more than 1,400 letters on 198 different subjects were written, 1,450 determinations of minerals were made, and more than 600 people called personally to consult about mineralogical and mining subjects. Letters were received from every State, Alaska, Puerto Rico, Hawaii, the Philippines, and 18 foreign countries.

Lectures on mining and mineralogical subjects were delivered in New York, Philadelphia, and Spruce Pine, N.C.

Little knowledge concerning the production, quantities, and uses of gases other than those used for fuel has been published, and such information is being gathered for publication in the Minerals Yearbook.

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HEALTH AND SAFETY BRANCH

SAFETY DIVISION

Safety records of 1931, 1932, and 1933.—The calendar year 1931 established a record low rate of mine-accident occurrence in both coal and metal mining, 1932's rate was almost as favorable, and 1933 had by all odds the best or lowest accident rate in the history of coal mining, in spite of the fact that periods of financial depression, with a recession of activity in mining, have been accompanied almost invariably by sharp increases in mine-accident rates. During the fiscal year 1934 only one major disaster occurred—in September, with a loss of 7 lives; the annual record was by far the best in the history of the United States as regards avoidance of major coal-mine explosion disasters. For 11 months in the fiscal year 1934 as well as 11 months in 1933 no major explosion occurred in the coal mines of this country, the best records in the present century.

Various factors undoubtedly are responsible for these excellent safety records, but unquestionably the efforts of the United States Bureau of Mines to advance health and safety in mining are having a vital influence. During the past 7 years the Bureau has trained nearly 520,000 persons in the mining and allied industries in first aid or mine rescue; first-aid-trained men not only avoid accidents to themselves but help to prevent accidents to others.

Rock-dusting, long advocated by the Bureau to prevent wide-spread coal-mine explosions, is now preventing numerous such disasters and saving many lives annually.

In addition, largely as a result of various Bureau activities, many accidents from falls of roof, haulage, explosives, electricity, and other causes are now prevented; proof is offered in data from individual mines, mining companies, and other organizations, and State inspectors where cooperative safety activities have definitely reduced accidents from the various causes enumerated.

Safety training.—Among its varied activities during the fiscal year 1934 the Safety Division's total field personnel of 22 engineers and 23 safety instructors gave full first-aid or mine rescue courses to 56,728 persons in the mineral industries in 462 communities in 31 States, a decrease of approximately 24 percent from the previous year, or slightly less than the percentage of decrease in funds and personnel available for this work. To date the Bureau has given these courses of safety training to 812,378 persons; 455,970, or more than 56 percent, were trained in the last 5 years. It is believed that, as a result of this work, several hundred lives are saved annually by direct application of first aid and several thousand nonfatal accidents avoided by use of safer mining methods.

To June 30, 1934, certificates were issued to 1,148 mineral establishments indicating that all their employees had received the Bureau of Mines first-aid course. During the past fiscal year, 111 of these 100-percent certificates were issued, covering the training of 20,133 persons, or about 35.5 percent of the training done by the Bureau.

The accident-prevention course in bituminous-coal mining, for instructing bituminous-coal-mining officials in up-to-date accident-prevention methods, is so extensive that several weeks are required for presentation, and necessarily the classes are relatively small. In 1934 the full course was given to 529 mining officials, and nearly 600 others took part of it; 5,513 bituminous-coal-mining officials have taken the full course since it was instituted in the late fall of 1930.

In all, 550 first-aid instructors' certificates were issued during the year, bringing the total to 4,567 since this training was begun in 1930; these certificates are eagerly sought, as holders thereof are being given preference in employment by many agencies and industries.

Holmes Safety Association.—At the annual meeting, on March 5, 1934, of the Joseph A. Holmes Safety Association, an organization sponsored by the Bureau of Mines, 12 medals were awarded to individuals for deeds of heroism, and 70 certificates of merit were awarded for outstanding safety achievements in the mineral and allied industries. The recognition given meritorious safety effort in these industries through the Joseph A. Holmes Safety Association awards stimulates safety effort; scores of excellent safety records have been made by mining organizations during the past few years either through the attempt to obtain one of these awards or to equal or surpass the accomplishments on which past awards have been based. In fact, a dozen or more coal mines have been given awards for operating a year or more without one lost-time accident, which was deemed impossible a few years ago.

In the past year 32 community safety clubs were organized as Holmes Safety chapters, with a new membership of 6,707 persons. Approximately 200 chapters are now functioning actively, with a membership approximating 60,000. Safety Division field men made safety talks before about 200 Holmes chapter meetings during the year; the mimeographed Holmes Safety Chapter Notes were, however, discontinued due to the necessity of economizing under the radically reduced allotments available.

Aid at accidents.—The Safety Division personnel rendered assistance and had contacts of various kinds at explosions, fires, and other accidents in the mineral industries during the year as follows: 26 explosions in 6 States (28 persons killed and 55 injured); 18 fires in 8 States (6 persons killed and 3 injured); and 55 miscellaneous accidents in 13 States (52 persons killed and 93 injured).

Safety inspections.—Making safety inspections and reports on mines and other mineral plants continued to constitute a major activity of the Safety Division in promoting health and safety in mining. Division field men made 221 confidential reports based upon safety examinations or inspections of mining properties during the year; 61 were transmitted to operators for their confidential information, but no reports of this type are published.

Safety meetings.—Attendance at safety meetings and general participation in the proceedings or discussions are part of the duties of the personnel of the Safety Division; usually these meetings are held at night, after a full day in or around mines in forwarding some phase of the Bureau's safety work. In the fiscal year 1934 the field men of the Safety Division attended 612 safety meetings in 30 States, attended by about 107,000 persons in all. These meetings are in addition to those of a routine nature in giving first-aid or mine rescue training or the accident-prevention course; such courses are also given at night meetings.

Publications.—More than 50 reports relating to safety in mining were published during the year.

Conclusions.—The very heavy reduction of funds for the fiscal year 1934 not only forced dismissal of 13 engineers and field safety workers of the Safety Division, as well as 3 clerks and 2 cooks, but also so severely curtailed travel and supply funds for the 45 field men who remained that they were able to function with but limited efficiency. As one of the results of the diminished funds for the work in the fiscal years 1933 and 1934 it has been found necessary to abandon 8 of the 10 mine rescue cars temporarily, and the safety work of the Bureau is being handicapped very seriously thereby.

Although the accident rate of the mining industry was greatly improved in the calendar years 1931, 1932, and 1933, it still has by far the highest rate of the major industries in the United States as well as in the countries of the world where mining is done to any considerable extent. That there is no necessity for this is now proved by the fact that many individual mines or mining companies have been operating for at least a year during the past 5 or 6 years without accidents and in doing so have reduced not only the misery due to them but operating costs as well. The 20 or more years of effort by the Bureau of Mines have been rewarded by the reduction of mine-explosion disasters 90 or more percent in number and in fatalities. Indubitably, other types of mine accidents, such as those from falls of roof or of persons, haulage, explosives, and electricity, can also be reduced 75 to 90 percent if all mining people can be educated to the idea that such accidents can be avoided. The Federal Government, through its Bureau of Mines, is the agency by far the best-equipped to do this educational work, which has been put under way largely

in the past half decade. Results thereof have already been reflected in virtual avoidance of major disasters during that period and in the lowest fatality rates in American coal-mining history during 1931, 1932, and 1933.

HEALTH DIVISION

Although the Health Division was recessed as of July 15, 1933 because of the severe curtailment of Bureau of Mines appropriations many health studies were made in and around mines during the past fiscal year, one of the most important being an investigation of illumination. Special work was done on numerous phases of the use of explosives in mines, on the dustiness of mine air and its effect on health, on conditions that cause various kinds of accidents in mines, on the various items that enter into the cost of accident occurrence in the mining industry, and on the use of protective clothing. Many of the papers published by the Safety Division referred to health in and around mines. There is now a much greater demand for investigations into health features of the mineral industries than in any other period of the Nation's history.

DEMOGRAPHICAL DIVISION

Through the collection and analysis of statistics known to be impartial, the Demographical Division supplies the factual basis needed for investigations of accidents in mines and quarries and of means for their prevention. Two outstanding facts were revealed by the work of the past year:

1. Minerals produced in the United States in the calendar year 1933 were, in general, obtained at a smaller loss in life and limb per ton.

2. A rapidly increasing number of companies are operating their properties not only without fatal accidents among their employees but also without a lost-time injury to any worker.

Bituminous-coal mines.—Although complete statistics for the calendar year 1933 are not yet available, partial information indicates a gratifying reduction in the accident-frequency rate per million man-hours of exposure to mining hazards and a more notable reduction in the frequency of accidents per million tons of coal produced. The industry employed more men, produced more coal, and worked a larger number of man-hours in 1933 than in 1932, judging from reports from a number of companies whose mines were in operation during both years. The reduction in the accident rates for 1933 was accompanied by a decrease in the production of coal per man-hour of work performed. Available information regarding the rates for the first 6 months of 1934, covering fatal accidents only, shows further progress, though slight, compared with the first half of 1933.

Anthracite mines.—Records now available indicate that the accident rate for anthracite mines, both on a man-hour-of-exposure basis and

on a tonnage basis, was lower and therefore better in 1933 than in 1932. Reports for identical mines operating in both years showed a larger number of men employed in 1933 but a smaller output of coal and a smaller number of man-hours worked.

Metal mines.—The accident rate for the metal-mining industry increased in 1933, although the number of men employed at the mines and the number of man-hours worked during the year were less than in 1932. The tonnage of material handled per man-hour was slightly larger in 1933.

Nonmetallic mines.—Mines producing nonmetallic minerals experienced a higher accident rate in 1933 than in 1932. Although fewer men were employed the number of man-hours of work increased, and the tonnage of material mined also increased.

Stone quarries, cement mills, etc.—With a larger number of employees but with fewer man-hours of employment or exposure to occupational risk, the stone-quarrying industry and such related activities as rock-dressing and the manufacture of cement and lime had a higher accident rate in 1933 than in 1932, according to reports from identical companies operating in both years.

Accident-prevention contest.—Definite evidence of increasing interest in accident prevention and of tangible benefits and savings that follow is furnished by the participation of 332 mines and quarries in the ninth national safety competition conducted by the division. Statistical analysis of the accident reports from the participating companies for the past year showed an increasing number of mines and quarries achieving perfect safety records, that is, conducting their operations without an accident causing loss of time to an employee. Particularly gratifying was the operation of six bituminous-coal mines, which are enrolled in the contest, without an accident. Information received from many of the companies indicates that national competition in accident-prevention effort is a potent means of promoting safety and of maintaining the interest of management and employees in safety throughout the year. Moreover, as the accident reports from the companies and the reports of man-hours of work performed are certificated by the companies as to completeness and accuracy, they constitute a source of reliable data indicating possible trends in technological and economic studies of the mineral industries, in addition to serving their immediate purpose—the prevention of accidents and maintenance of interest in safety.

Explosives.—Nearly 70 percent of all explosives used for industrial purposes in the United States are consumed by the mineral industries. The actual production of explosives in 1933 was 33,927,443 pounds of permissible explosives, 157,849,273 pounds of other high explosives, and 64,210,675 pounds of black blasting powder.

Conclusions.—Although excellent progress in reducing human and economic waste due to accidents is being made by many mining and quarrying companies, other large sections of the industry continue to operate under high accident rates. Intensive statistical research should be conducted to reveal more fully prevailing conditions in those sections of the mining industry in which progress in safety is slow or absent. The loss of 4 from an already undermanned force of 15 employees has seriously handicapped the division in conducting its work, which involves the collection, compilation, and analysis of reports from all mines and quarries in the United States. The most pressing need of the division is an adequate personnel trained in the science of statistics as applied to the mineral industries. The cost of such personnel would be infinitesimal compared with that of accidents which might be prevented by applying the results of appropriate statistical research.

ADMINISTRATIVE BRANCH

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, clerical assignment, and general administrative routine.

On July 1, 1933, there were 63 employees in the division, 31 of whom were terminated or transferred to other divisions during the fiscal year, due to reduction of force. This reduction of 49 percent in personnel, compared with an average of 33 percent for the Bureau as a whole, made it impossible to supply the usual prompt service to the other divisions. Some temporary help, mostly for the duplicating service, was hired late in the year to bring a large accumulation of work up to date. In the clerical service section, which during the 2 preceding fiscal years supplied a large amount of stenographic and clerical service to the entire Bureau, 8 of the 9 employees on duty July 1, 1933, were terminated or transferred, a loss of 89 percent. The loss of personnel in the other sections ranged from 36 percent in the accounts section to 48 percent in the multigraph and property section and 50 percent in the mails and files section.

The Division needs the following additional employees to function properly and provide the minimum of service needed by the present reduced Bureau personnel: 1 graphotype operator, 1 multigraph operator, 2 assistant messengers, 1 junior messenger, 1 file clerk, and 2 clerk-stenographers.

The curtailed personnel in the Office Administration Division, as well as in other divisions of the Bureau, has necessitated shifting the

duties of many employees who remained. In some instances these changes have increased the responsibilities of employees to such an extent as to warrant higher allocations; in others, although reallocations are needed, the grade would remain the same.

Personnel.—On June 30, 1934, there were 523 full-time appointed employees on duty at the Bureau, including 22 employees hired temporarily for job work; in addition, there were 3 full-time cooks who had been hired under field agreements. The appointed employees were distributed as shown in the following table:

	Classification and number of appointees				
	Professional	Subprofessional [1]	C.A.F.	Custodial [2]	Total
Washington	[3] 38	4	131	7	180
Pittsburgh	[4] 62	28	41	42	173
Field in general	[5] 96	24	31	19	170
Total	[6] 196	56	203	68	523

[1] Includes instrument makers, safety instructors, laboratory aids, assistants, etc.
[2] Includes motor-truck drivers, janitors, laborers, messengers, etc.
[3] Engineers, 17; chemist, 1; miscellaneous, 20; total, 38.
[4] Engineers, 30; chemists, 25; miscellaneous, 7; total 62.
[5] Engineers, 50; chemists, 24; miscellaneous, 22; total, 96.
[6] Total, engineers, 97; chemists, 50; miscellaneous, 49; grand total, 196.

In addition to the foregoing full-time employees, the following persons were engaged on a "when-actually-employed" basis: 24 laborers, etc., employed on field agreements; 1 consulting mineralogist; and 60 other employees holding classified, unclassified, or excepted appointments on a part-time basis, making a total of 611 employees, a decrease of 280 employees compared with the number on duty on June 30, 1933.

Property.—The property records, as of June 30, 1934, show accounts as follows:

Automobiles and trucks	$78, 618. 22
Canvas and leather goods	2, 985. 84
Drafting and engineering instruments	9, 926. 37
Electrical equipment	64, 686. 67
Hardware and tools	33, 087. 93
Household equipment	19, 863. 93
Laboratory apparatus	468, 835. 66
Medical equipment	8, 355. 61
Office furniture and equipment	290, 692. 21
Photographic apparatus	26, 806. 45
Machinery and power-plant equipment	1, 004, 805. 54
Land, buildings, and improvements	1, 364, 945. 97
Rescue cars and specialized apparatus	403, 678. 31
Total	3, 777, 288. 71

This property is located in Washington and at the various field stations and offices of the Bureau.

The total given above indicates a decrease of $959,341.63 under the figure for June 30, 1933, due principally to the transfer of the Government Fuel Yards to the Procurement Division of the Treasury Department.

INFORMATION DIVISION

The Information Division comprises five sections concerned with dissemination of information resulting from the various investigations of the Bureau.

Publications.—During the past year the publications section supervised the distribution of 107,600 copies of the free editions of the Bureau's printed publications and approximately 160,000 reports of investigations and information circulars. These were sent, however, only as the result of a direct request by the recipient either for a specific publication or for all publications on a particular subject.

In addition, about 100,000 copies of the Bureau's printed reports were sold by the Superintendent of Documents.

Numerous brief press statements, announcing the issuance of new publications or giving particulars in regard to current investigations, were furnished to the daily and technical press. These short items were widely printed and served effectively in acquainting the public promptly with the results of the Bureau's work.

The section answered more than 50,000 letters requesting publications or information regarding the Bureau's activities and general mining subjects.

Editorial.—During the past year 9 bulletins, 4 technical papers, 1 economic paper, 101 Mineral Resources and Minerals Yearbook separate chapters, and 6 miscellaneous papers—a total of 121 printed publications—were edited and sent to the printer. Owing to lack of printing funds, however, only part of the Bureau's output could be issued in this manner; consequently, 115 papers had to be published in the technical and trade press by technical societies, cooperating educational, State, and municipal institutions, or similar outside agencies.

The section also edited 44 reports of investigations and 73 information circulars. These are papers designed to supply promptly to the mining industry and the general public the essential results of the Bureau's investigations, which are usually described in detail in later printed reports, or to present salient facts on subjects of interest in a concise form suitable for use in reply to inquiries.

Motion-picture production.—As a means of disseminating information regarding safety and efficiency in the mineral industries, the Bureau maintains what is perhaps the largest library of educational

motion-picture films in the world. These films, prepared under the supervision of the Information Division and through the cooperation of industrial concerns which bear the entire cost of production, show where essential minerals are found and how they are extracted from the earth, manufactured or refined into useful everyday products, utilized, and conserved. The prevention of accidents and the protection of human life have been given special attention, and several pictures deal specifically with this important subject.

During the past year 7 film subjects were revised, and 578 additional reels were obtained for circulation.

Library.—The year's accessions to the library comprised 2,487 books and pamphlets; 300 periodicals were currently received; and 4,187 books were loaned for use outside the library.

Graphic section.—In addition to drafting and photographic service, the graphic section circulates the Bureau's motion-picture films. This work is centralized at the Pittsburgh Experiment Station, but there are 12 subdistribution centers throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but the exhibitor is asked to pay transportation charges. On June 30, 1934 the Bureau had 1,104 sets of films, including 1,242 reels, aggregating 1,730,000 feet. During the year the films were shown on 49,457 occasions before an estimated audience of 4,069,000 persons.

Conclusions.—The Information Division, as the outlet through which the results of the Bureau's scientific investigations are made available to the mining industry and to the general public, rendered valuable and efficient service during the year in editing more than 350 manuscripts, distributing a quarter of a million publications, revising and circulating educational motion-picture films, answering letters and inquiries, and preparing statements that were widely printed in the daily, trade, and technical press.

The full practical value of scientific investigations conducted by the Bureau obviously cannot be realized by the mining industry unless the results are made generally available in printed reports. The Bureau is greatly handicapped by lack of adequate printing funds. The allotment of $104,800 in 1932 was cut to $37,000 in 1934—less than that of any year since the first year of the Bureau's establishment. As a result it was possible to print only 9 bulletins and 4 technical papers in 1934 compared with 25 and 36 in 1932. It is highly important that the Bureau's printing funds be increased by at least 100 percent to permit printing the results of investigations and make them available to the industry.

DIVISION OF SUBSISTENCE HOMESTEADS AND FEDERAL SUBSISTENCE HOMESTEADS CORPORATION

(Charles E. Pynchon, General Manager)

ESTABLISHMENT OF SUBSISTENCE HOMESTEADS PROGRAM

Authority for a subsistence homesteads program was established by Congress in section 208, title II, of the National Recovery Act, which empowered the President to designate an agency to make loans and otherwise aid in the purchase of subsistence homesteads. Congress voted an appropriation of $25,000,000, with the specification that homesteaders' repayments should constitute a revolving fund.

The Subsistence Homesteads Division of the Department of the Interior was organized August 23, 1933, pursuant to an Executive order of July 21, 1933. The Federal Subsistence Homesteads Corporation was created by the Secretary of the Interior to act as the Division's operating agency.

The Division of Subsistence Homesteads operated during the first months of its existence under the direction of Dr. M. L. Wilson, who resigned as of June 30, 1934, to become Assistant Secretary of Agriculture. The Division is now under the direction of Charles E. Pynchon, general manager of the Federal Subsistence Homesteads Corporation. The first 10 months of the Division's existence have seen the subsistence homesteads program proceed through the earlier formative stages to a present stage where progress may be measured in acres under improvement, houses constructed, and families living in their new homes and working upon their homesteads.

PROGRESS TO DATE

The close of the first 10 months of the Division's existence finds 57 projects approved and allotted their portion of the $25,000,000 fund. Of these projects, 40 have been publicly announced. An additional project, designed for rural rehabilitation in northern Wisconsin, has been transferred to other Government agencies which are undertaking this type of work.

Substantial advances have been made to 27 projects. As of June 30, 1934, allotments totaled $16,533,970; advances and authorizations, $2,121,355.79.

Land has been purchased for 25 projects. House construction has been started on 9 projects, and preliminary work is well under way on numerous others.

As an important corollary to its main function, the program of the Division, at the end of the fiscal year, was giving employment outside of the administrative and technical personnel to 1,851 persons, whose wages for work performed in June 1934, totaled $106,010.93.

In the following section will be found a concise summary of each project.

PROJECT SUMMARY AND STATUS

Birmingham, Ala. (No. 1).—Allocation, $750,000; number of homesteads, 300; acreage, 2,109. A workingman's garden project outside of Birmingham; complete project calls for 300 homesteads, estimated to cost $2,500 each; project to begin with a 60 homestead unit. Surveys have been made; work on 60 wells under way; bids now being asked for construction of 60 houses in first unit.

Jasper-Putnam Counties, Ga. (No. 2).—Allocation, $1,000,000; number of homesteads, 500; acreage, not yet determined. An experimental agricultural project furnishing an opportunity for tenants to become owners. Development to start with initial unit of 50 homesteads; 15,000 acres have been purchased; 8 houses built.

Pender County, N.C. (No. 3).—Allocation, $1,000,000; number of homesteads, 300; acreage, 4,825. An experiment in rural rehabilitation. The first development is for 200 families. Personnel selected; 4,500 acres purchased; 325 additional acres to be purchased. One thousand acres cleared; half planted to crops. Ten houses being constructed by force account; additional house plans being prepared.

Decatur, Ind. (No. 4).—Allocation, $125,000; number of homesteads, 48; acreage, 80. Homesteads costing approximately $2,500 each will have 3-, 4-, or 5-room houses. Homesteaders will be selected from industries of Decatur. Land acquired; land planning completed; house plans approved and bids requested; water and street utilities constructed.

Hightstown, N.J. (No. 8).—Allocation, $500,000; number of homesteads, 200; acreage, 1,197. Individual homesteads on 1 acre lots; settlers, unemployed or partially employed skilled Jewish needle workers. There will be a community owned dairy farm, truck farm, general store, and small clothing factory. Land acquired; project manager, engineer, and architect appointed.

Phoenix, Ariz. (No. 9).—Allocation, $500,000; number of homesteads, 300; acreage, not yet determined. Complete project will have units scattered throughout the State. Units I and II, near Phoenix, provide for 49 homesteads. Houses of adobe construction; each homestead will cost approximately $2,700. Eighty acres of land selected for unit I, 24 homesteads; 75 acres of land selected for unit II, 25 homesteads; ground and house plans approved; bids being requested. Land selected for unit III at Tucson; titles being examined.

Youngstown, Ohio (No. 10).—Allocation, $500,000; number of homesteads, 137; acreage, 300 (approximate). For white collar type homesteaders, employed an average of 34 hours per week at average annual salary of $1,320. Planned for 137 homesteads costing approximately $3,600 each. Land optioned, selection being made; house plans approved; bids being asked.

Dayton, Ohio (*Nos. 12 and 38*).—Allocation, $50,000 (unit I), $309,400 (units II to V); number of homesteads, 35 (unit I), 165 (units II to V); acreage, 160 (unit I), not yet determined (units II to V). Planned for development in five separate units; to accommodate workers in the city's industries. For unit I money was loaned to a local corporation; houses under construction. The four additional units will be under Federal management; one to take care of Negro workers.

Duluth, Minn. (*No. 15*).—Allocation, $104,000; number of homesteads, 40; acreage, 400. Situated 7 miles from Duluth. Homesteads are working men's gardens, planned to cost approximately $2,500 each. Land purchased and being cleared; roads and utilities under construction; house plans being prepared.

Austin, Minn. (*No. 16*).—Allocation, $125,000; number of homesteads, 44; acreage, 216. Situated near Austin; drawing homesteaders from workers in Hormel Packing Co. Provides for 44 homesteads, to sell for approximately $2,800 each. Land acquired; construction of public utilities completed; house plans approved and bids requested.

Wilmington, Del. (*No. 18*).—Allocation, $210,000; number of homesteads, 70; acreage, 309. Situated 5 miles outside of Wilmington. Complete homesteads planned to sell at approximately $3,000. Project manager, architect, and engineer selected; house plans in preparation.

Houston, Tex. (*No. 21*).—Allocation, $250,000; number of homesteads, 80; acreage, 320. For wage earners with incomes of from $80 to $150 per month. Homesteads expected to cost $3,000 each. Five miles of streets completed; 20 houses completed; remaining 60 houses to be completed by October 1, 1934.

Dallas-Fort Worth, Tex. (*No. 22*).—Allocation, $250,000; number of homesteads, 80; acreage, 593. For industrial workers. Units to sell for from $2,500 to $3,000. Land purchased; 205 acres improved; roads constructed; house construction to start within 2 weeks under contract calling for 80 houses at approximately $140,000.

Wichita Falls, Tex. (*No. 23*).—Allocation, $125,000; number of homesteads, 50; acreage, 210. To accommodate workers in the oil industry; homesteads to sell at average price of $2,500. Land purchased; road construction completed; contract let for construction of 50 houses at approximately $80,000. House construction now in progress.

Three Rivers, Tex. (*No. 24*).—Allocation, $125,000; number of homesteads, 50; acreage, 160. For workers in glassware industry; homesteads to sell at estimated $2,500. Project includes low-cost housing program for Mexican laborers. Land purchased; roads constructed; irrigation system being built; entire tract planted to cover-crops. Contract let for construction of 50 houses at approximately $70,000; construction to begin within next month.

Beaumont, Tex. (*No. 25*).—Allocation, $125,000; number of homesteads, 50; acreage, 205. Located in a great oil area; to consist of homesteads averaging 7 acres each, to sell at approximately $2,500. Land purchased; roads constructed; public utilities being constructed. House construction under contract calling for $75,000 for 50 houses to begin within a month.

McComb, Miss. (*No. 27*).—Allocation, $80,000; number of homesteads, 25; acreage, 264. Designed to take up slack of seasonal employment. Development almost completed. Fourteen houses, 20 garages, and 10 barns and outbuildings completed; 6 houses almost completed; bids being asked for remaining 5 houses.

Laurel, Miss. (*No. 28*).—Allocation, 80,000; number of homesteads, 25; acreage, 238. Designed to accommodate industrial workers. Homesteads to be located on 5 acres with 3 to 5-room house; complete homestead to cost $2,500. Ground plans approved; roads constructed; land cleared and 50 acres planted; bids received for house and utility construction.

Tupelo, Miss. (*No. 29*).—Allocation, $80,000; number of homesteads, 25; acreage, 170. To accommodate textile workers. Homesteads complete, expected to sell for approximately $2,700. Land purchased and cleared; roads built. Contract let for construction of houses at cost of $44,000; construction to start within next month.

Richton, Miss. (*No. 30*).—Allocation, $400,000; number of homesteads, 58; acreage, 8,000 (approximate). Designed to demonstrate better utilization of cut-over land. Families will depend on agriculture for subsistence and to a limited extent for cash. Land purchased.

Meridian, Miss. (*No. 31*).—Allocation, $80,000; number of homesteads, 25; acreage, 233. For industrial workers. Homesteads planned to sell at $2,750. Land purchased; road work completed; crops planted; bids being received for houses and utilities.

Rochester, N.Y. (*No. 32*).—Allocation, $100,000; number of homesteads, 33; acreage, 50. Homesteads to consist of 1⅓ acres each, costing an estimated $3,000. Homestead group will be selected from technical, professional, and skilled occupational workers. Land purchased; ground plans approved; house plans being prepared.

Hattiesburg, Miss. (*No. 33*).—Allocation, $80,000; number of homesteads, 24; acreage, 129. For workers in seasonal, part-time, or casual employment. Homesteads will average seven acres each; planned to sell at approximately $2,750. Land purchased and cleared; roads built; contract let for house construction at approximately $46,000.

Jasper, Ala. (*No. 34*).—Allocation, $244,000; number of homesteads, 100; acreage, 2,096. Designed to aid in rehabilitation of coal miners. Each homestead will contain 20 acres and sell for approximately $2,900. Land purchased; budget prepared covering first unit of 24 houses; bids asked.

Longview, Wash. (*No. 36*).—Allocation, $160,500; number of homesteads, 60; acreage, 150 (approximate). Will draw homesteaders from lumbering industry. Each homestead will cost approximately $2,675 and contain approximately 2½ acres. Land under option, now being purchased; streets being constructed.

Los Angeles, Calif. (*No. 37*).—Allocation, $410,000; number of homesteads, 140; acreage, 140. Provides for 140 homesteads of 1 acre each. Homesteaders from partially employed industrial workers. Each homestead will cost estimated $3,000. One hundred acres purchased; bids being requested for house construction.

Granger, Iowa (*No. 39*).—Allocation, $125,000; number of homesteads, 50; acreage, 224. Four- to five-acre homesteads for part-time miners. Average homestead will sell for approximately $2,500. House plans prepared in Washington office.

Taylors, S.C. (*No. 40*).—Allocation, $100,000; number of homesteads, 40; acreage, 231. For workers in bleaching and textile industries; average annual income about $900. Five and three-quarters acres for each homestead; houses to be built at cost of $1,800 each. Land purchased; project manager appointed.

La France, S.C. (*No. 41*).—Allocation, $50,000; number of homesteads, 20; acreage, 116. Workingman's garden type for textile workers; average annual income per family about $800; each homestead allotted 5¾ acres. Houses to be built at estimated average cost of $1,800 each. Land purchased; project manager appointed.

Marshall, Tex. (*No. 47*).—Allocation, $125,000; number of homesteads, 35; acreage, not yet determined. Designed for part-time workers in seasonal industries. Homestead units to sell for estimated average of $2,500.

Lake County, Ill. (*No. 49*).—Allocation, $275,000; number of homesteads, 90; acreage, 900 (approximate). Contemplates 10-acre homesteads, to be distrib-

uted in units of from 2 to 10 homesteads. Homesteaders will be drawn from industrial centers north of Chicago. Project manager and architect selected; preliminary plans being prepared.

Tulsa, Okla. (No. 55).—Allocation, $125,000; number of homesteads, 48; acreage, 100 (approximate). Workingman's garden project; homesteaders employed by factories, in building trades, and in stores and offices. Homestead will consist of 2 acres with house of 4 or 5 rooms. Estimated cost of average homestead, $2,600.

Bastrop, La. (No. 57).—Allocation, $112,500; number of homesteads, 50; acreage, 250 (approximate). Proposes 5-acre homesteads near Bastrop. Houses will cost estimated average of $1,600 each.

OTHER PROJECTS

Six projects for stranded industrial groups have been established or planned. These are described in the section of this report dealing with stranded groups.

Reedsville Experimental Community is described in a special section.

Not included in the above list of projects are a number which are still in the planning stage, or are being studied with a view to their eventual adoption or rejection. These are located in the following States: Connecticut, Colorado, Pennsylvania, Alabama, Montana, Ohio, Arkansas, Virginia, North Carolina, Michigan, Florida, Kentucky, South Carolina, Maryland, Missouri, New Hampshire and New York.

Tentative allocations of funds have also been made for problem areas of which studies are being made. In addition to States where projects are already established or planned, Utah and Oregon are included in this tentative allocation.

PURPOSES AND FUNCTIONS

In carrying out the intent of Congress as expressed in section 208, the Division of Subsistence Homesteads has conceived its purposes to be as follows:

1. To assist in the decentralization of the overbalance of population of crowded industrial cities.

2. To encourage this decentralization by demonstrating that part-time wage work may be profitably combined with part-time work on small farms and gardens.

3. To test whether through this means stranded industrial groups can be rehabilitated without being transplanted to new areas, and, to this end, to induce industry to come to potential employees ready and anxious to work rather than to move the people to the industry.

4. In a more limited way, and in special areas, to conduct demonstrations of rural rehabilitation, thereby attracting the inhabitants of urban areas back to the land.

5. In all cases to raise the standard of living of the homesteaders affected, and to demonstrate that a livelihood which allies pay-roll employment and subsistence farming and gardening will make for economic stability, not only of the individual but of the Nation.

6. To act as experimenter and demonstrator, so that States, municipalities, and private enterprise may be encouraged to undertake subsistence homestead programs of their own, and in their undertakings be able to follow a path thoroughly tested and proven by this Federal Division.

It should be emphasized that the principal responsibility of the Division of Subsistence Homesteads is to assist families who are on an economic level above that of the sheer relief group. Congress specified that loans, not grants, should be made and that homesteaders should repay these loans. The Division must, therefore, select homesteaders with a reasonably assured income.

TYPICAL SUBSISTENCE HOMESTEAD

The average homestead approximates 5 acres in size. A typical house has from 4 to 5 rooms. In nearly all cases, with the homestead go essential farming and gardening tools, seed and fertilizer, and some livestock.

Costs vary, but the attempt is made to create a homestead which will sell complete, land, buildings, equipment, and livestock included, for an average of approximately $3,000.

ORGANIZATION

During its early months, various modifications of the original organization of the Division were found necessary. The Division was organized, approximately on March 1, 1934, into three main sections: Planning, construction, and operations (now community management).

Beginning in June, steps were taken to bring about a further reorganization, now in process, the object of which is to integrate the work of the Division into a still more efficient pattern.

A principal motive behind this last reorganization lies in the fact that on April 13, 1934, the character of community supervision was amended by an order of the Secretary of the Interior ending project management through local corporations and completely federalizing all projects. (See section of the report on "legal problems.")

PROJECT PLANNING

The Division of Subsistence Homesteads has had little opportunity to originate projects for its own program. It has had to depend chiefly upon outside individuals to supply the suggested locations and types of projects. Out of proposals and requests of all types, 601 projects requesting loans approximating $500,000,000 have been considered in some degree worthy.

PROJECT TYPES

In establishing homestead communities, the following types of development have been considered:

Most numerous and most important of the project types is that designed to accommodate part-time or low-wage industrial workers. A second type deals with the so-called stranded industrial population. A third type, limited to a few projects, has been established to deal with stranded agricultural populations.

Projects are established without discrimination as to race, creed, or color. The important problems faced by Negro populations, both in the South and in the North, are being dealt with. There are several projects in the process of planning which will serve the Indian population. The Mexican element in the Southwest has been provided for. It was also considered that certain of the insular possessions should receive their portion of the allocation; a project, therefore, has been planned for the Virgin Islands.

FUTURE PLANNING

The future of the Division contemplates the origination of projects within the Division rather than through outside sources. An originating unit has been set up whose function is to survey the country as a whole in such a way as to determine where the various types of projects may be most effectively undertaken.

CONSTRUCTION

In developing the planned projects, the Division has faced the problem of providing land adequate in size and fertile enough in nature to grow the necessary foodstuffs, and houses sound, well designed and of sufficient size to accommodate the homesteaders' families—all this within a very limited budget.

HOUSES

The standards of the Division require: (1) Simplicity in design; (2) suitability to local climatic conditions and traditions; (3) planning to encourage the usability of all rooms; (4) provision of living rooms with adequate space for family use; (5) arrangement for easy access between kitchen and living room (due to cost, few dining rooms can be provided); (6) provision of kitchens with cross-ventilation, and space and built-in equipment essential to convenient operation; (7) adequate bedroom space for each member of the family.

It is seen to that the materials used are of the best possible quality, commensurate with the homesteader's ability to liquidate the cost of his homestead. Homestead houses must be of such sound con-

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struction that maintenance costs will be low over the extended purchase period.

These essential features must be achieved at a minimum cost. Earlier houses have cost somewhat more, but houses now under construction will cost, it is estimated, as low as $2,000 or even $1,500. Progress to date indicates that this cost level can be attained.

Homestead houses vary in size from 3 to 6 rooms, but only such 3-room houses are designed as may be expanded to at least 5 rooms with a minimum of alteration.

COMMUNITY MANAGEMENT

As the development of the Subsistence Homesteads program has proceeded, the operations section, in the future to be known as the "community management section", has grown in importance and duties. To date 23 projects have progressed to the stage of operations.

A total of 13,934 applications have been received for 2,176 homesteads, exclusive of the stranded group projects. Tentative selections have been made of 618 applicants, and 145 homesteaders definitely have been accepted. The average annual income of families accepted is $1,258.85; the average size of the families is 3.77; one member of each family has employment in local industries.

The selection of homesteaders is based on age, health, cash income, nationality, farm experience, adaptability and attitude toward a subsistence homestead life. All homesteaders must be American citizens.

Agricultural production has been started in the case of several projects. To date, 1,244 acres of land are under cultivation; feed and food commodities are being grown, and 14,377 quarts of vegetables have been canned.

STRANDED GROUPS

Allocations have been set aside for six projects, to be developed under the self-help plan, for stranded groups of unemployed to whom the future, even with complete economic recovery, holds no industrial promise.

One project, Westmoreland, was located in southwestern Pennsylvania; Tygart Valley was selected in central West Virginia; Cumberland Homesteads in central Tennessee; southern Illinois is the site of another project. Two more projects have been located, one in central Pennsylvania, another in Kentucky.

The last two projects above were approved so recently that nothing had been started in their development prior to June 30. The Illinois project is just getting under way.

Progress in more detail on the three projects furthest advanced is as follows:

Westmoreland County, Pa.—At Westmoreland, 92 homesteaders have been selected, 82 of whom are working on the project. Work is going forward on the house construction. A large flock of pure-bred chickens is being raised. One hundred acres of hay and 68 acres of wheat have been harvested, and crops of potatoes and truck vegetables are flourishing.

Tygart Valley, W.Va.—At Tygart Valley, 99 homesteaders have been selected, 61 of whom are working on the project. The foundations of 15 houses have been completed and the first-story framing of 14 houses is up. Three hundred acres of land have been planted to vegetable crops. A limestone quarry has been opened up.

Crossville, Tenn.—At Cumberland Homesteads, 167 homesteaders have been selected of whom 115 are working on the project. Nine houses are under construction, while 25 barns, 38 poultry houses, and other small outbuildings have been completed. Three hundred acres of land have been planted. A sawmill, operated on the project, has sawed 430,000 feet of lumber and 400,000 shingles from timber cut off the property, which is being used in the construction of houses and outbuildings. A stone quarry has been opened up to supply building material for the houses.

REEDSVILLE EXPERIMENTAL COMMUNITY

Reedsville Experimental Community, near Reedsville, W.Va., while one of the stranded group type, falls into a distinct category. The project involves the establishment of subsistence homesteads for the families of 200 stranded coal miners from the closed mines of Preston and Monongahela Counties. But in addition to performing the homestead function common to all projects, the Reedsville project is also an experimental undertaking.

At Reedsville, preference is given to homesteaders who have large families of young children. Homesteaders are being employed on land improvement, construction work, and community farming prior to the establishment of factories which are expected to be brought to the community by private interests.

Each homestead comprises approximately 5 acres. The first 50 houses consist of remodeled portable houses with full basements, hot air pipe furnace, and modern plumbing. These houses are now complete, and 32 are occupied as of June 30, 1934. The 150 houses still to be built will be of standard frame construction equipped with a combination cook stove and blower heating plant, a small basement for vegetable storage, and modern plumbing.

The land so far acquired, comprises approximately 1,100 acres. Additional land may eventually be purchased. An original allocation of $600,000 is expected to be increased when plans for further development of the project have been completed.

Reedsville Experimental Community, as its name has indicated from the first, has been, and will continue to be, the testing ground

where the Division of Subsistence Homesteads conducts various experiments in community planning, community farming, house construction, education, and in other fields where the solution of some particular problem will prove of benefit to the entire subsistence homesteads program. Through the experiments at Reedsville, the Division has already been able to cut costs and apply tried methods of planning, construction, and management in the case of other projects.

LEGAL QUESTIONS

The Division of Subsistence Homesteads has been faced with numerous legal questions. The first problem was the formulation of an administrative vehicle which could serve as an agency for the establishment and operation of subsistence homestead communities. Pursuant to the departmental order of December 2, 1933, the Federal Subsistence Homesteads Corporation was formed under the laws of Delaware.

It was decided that for each subsistence homestead project, a subsidiary corporation should be organized, the stock of the subsidiary corporation to be subscribed for by Federal Subsistence Homesteads Corporation. This plan of operation was followed in the case of 30 projects and was continued until April 13, 1934, when the Secretary of the Interior ordered its termination and the operation of projects directly by the Federal organization.

The decision to operate the subsistence homesteads on a Federal project basis raised several urgent questions touching upon the status of the homesteads and their occupants. The statutes with reference to the purchase of real property, the awarding of contracts, and the exemption of Federal property from local taxation raised problems which have been submitted for opinions to the Solicitor of the Department of the Interior and the Attorney General of the United States.

At the close of the fiscal year preparation is being made for the organization of homesteaders into cooperatives for the operation of community farms, community stores, community workshops, community dairies and orchards. Work is likewise going forward for the preparation of contracts to be entered into by Federal Subsistence Homesteads Corporation with local authorities for the payment of gross cash sums annually in lieu of taxes, so as to compensate local governments for special services which they may render to subsistence homesteads projects, such as police protection, fire protection, and the provision of roads and school facilities.

Project		Land	Houses	Total expenditures made by project	Expenditures, Washington office (undis.)	Total expenditures	Unexpended balance	Total allotment
No.	Name	Cost, acquisition, clearing, and improving						
1	Birmingham, Ala	$180,339.98	$378.52	$192,913.17	$11.54	$192,924.71	$557,075.29	$750,000
2	Jasper-Putnam Counties, Ga	94,432.39	11,090.36	124,451.77	264.58	124,716.35	875,283.65	1,000,000
3	Pender County, N.C	87,819.12	400.60	164,545.67	23.00	164,568.67	835,431.33	1,000,000
4	Decatur, Ind	7,985.75		9,685.30	7.76	9,693.06	115,306.94	125,000
5	Connecticut						100,000.00	100,000
6	Westmoreland County, Pa	138,170.99	7,606.92	166,381.84	22.88	166,404.72	458,595.28	625,000
7	Tygart Valley, W.Va	124,207.67	1,020.82	176,210.50	239.89	176,450.39	498,549.61	675,000
8	Hightstown, N.J	95,072.89		111,860.51	11.54	111,872.05	388,127.95	500,000
9	Phoenix, Ariz.[1]	27.60		3,893.17	225.27	4,118.44	495,881.56	500,000
10	Youngstown, Ohio [1]	1,471.65		13,260.56	11.54	13,272.10	486,727.90	500,000
11	Colorado				3.98	3.98	499,996.02	500,000
12	Dayton, Ohio (first unit)							
13	Reedsville, W.Va	173,214.41	215,128.01	560,122.88	917.00	561,039.88	38,960.12	600,000
14	Pennsylvania						200,000.00	200,000
15	Duluth, Minn	5,496.91		5,496.91		5,496.91	98,503.09	104,000
16	Austin, Minn	10,361.68		11,455.24	7.76	11,463.00	113,537.00	125,000
17	Alabama						200,000.00	200,000
18	Wilmington, Del	21.45		430.07		430.07	209,569.93	210,000
19	Crossville, Tenn.[1]	16,544.21	9,425.80	82,985.87	22.88	83,008.75	741,991.25	825,000
20	West Frankfort, Ill.[1]	1,655.33		16,304.16	25.65	16,329.81	533,670.19	550,000
21	Houston, Tex	56,764.28	22,556.58	94,192.87	19.10	94,211.97	155,788.03	250,000
22	Fort Worth-Dallas, Tex	43,940.24		53,591.47	7.76	53,599.23	196,400.77	250,000
23	Wichita Falls, Tex	20,838.75	418.95	27,090.95	27.91	27,118.86	97,881.14	125,000
24	Three Rivers, Tex	26,535.24	160.60	33,692.12	9.76	33,701.88	91,298.12	125,000
25	Beaumont, Tex	12,767.34		18,683.04	7.76	18,690.80	106,309.20	125,000
26	Wisconsin				75.19	75.19	749,924.81	750,000
27	McComb, Miss	5,738.16	25,956.18	37,659.15	160.60	37,819.75	62,180.25	100,000
28	Laurel, Miss	2,010.33		6,533.16		6,533.16	93,466.84	100,000
29	Tupelo, Miss	6,259.37	1,055.97	12,308.66	161.57	12,470.23	87,529.77	100,000
30	Richton, Miss	26,753.24	1,159.10	39,203.36	161.57	39,364.93	360,635.07	400,000
31	Meridian, Miss	6,378.53		9,138.87	351.38	9,490.25	90,509.75	100,000
32	Rochester, N.Y				3.98	3.98	99,996.02	100,000
33	Hattiesburg, Miss	3,133.51		6,844.02	38.57	6,882.59	93,117.41	100,000
34	Jasper, Ala	55,657.47		61,182.78	7.76	61,190.54	182,809.46	244,000
35	Montana						148,000.00	148,000
36	Longview, Wash						160,000.00	160,000
37	Los Angeles, Calif	63,772.50		64,611.11		64,611.11	345,388.89	410,000
38	Dayton, Ohio (additional units)						309,400.00	309,400
39	Granger, Iowa				3.78	3.78	99,996.22	100,000

[1] Land not purchased and paid for June 30, 1934. Amount shown is acquisition expense.

Division of Subsistence Homesteads and Federal Subsistence Hhomesteads Corporation—Allotments and expenditures, June 30, 1934—Con.

Project		Land	Houses	Total expenditures made by project	Expenditures, Washington office (undis.)	Total expenditures	Unexpended balance	Total allotment
No.	Name	Cost, acquisition, clearing, and improving						
40	Taylors, S.C	$13,740.00		$13,740.00		$13,740.00	$86,260.00	$100,000
41	La France, S.C						50,000.00	50,000
42	Montana						225,000.00	225,000
43	Ohio						236,000.00	236,000
44	Fort Smith, Ark				$18.21	18.21	89,981.79	90,000
45	Helena, Ark				18.21	18.21	89,981.79	90,000
46	Ouachita, Ark				18.23	18.23	24,981.77	25,000
47	Marshall, Tex						125,000.00	125,000
48	(Reserved)							
49	Lake County, Ill						275,000.00	275,000
50	Pennsylvania						250,000.00	250,000
51	Do						300,000.00	300,000
52	North Carolina						100,000.00	100,000
53	Florida						50,000.00	50,000
54	Michigan						281,070.00	281,070
55	Tulsa, Okla						125,000.00	125,000
56	Kentucky						350,000.00	350,000
57	Bastrop, La						112,500.00	112,500
58	South Carolina						184,000.00	184,000
59	Maryland						500,000.00	500,000
		1,281,110.99	$296,358.41	2,118,469.18	2,886.61	2,121,355.79	14,432,614.21	16,553,970

THE SOIL EROSION SERVICE

HUGH H. BENNETT, Director

ESTABLISHMENT OF THE ORGANIZATION AND ITS OBJECTIVES

The Soil Erosion Service was established in October 1933 under the office of the Secretary of the Interior, to administer a grant of $5,000,000 made by the Federal Emergency Administration of Public Works for erosion work. An additional $5,000,000 was allocated for the same purpose at a later date and became available for expenditure in late March 1934.

The objectives of the Soil Erosion Service are: (1) To demonstrate that the impoverishment and destruction of our remaining areas of good agricultural land by continuing erosion can be largely controlled; and (2) to lay the foundation for a permanent national erosion-control program of adequate scope to meet the acute land crisis created by wasteful methods of land utilization.

THE PROBLEM

Accelerated soil erosion resulting from improper land-use practices has been manifest since the early settlement of the country. The evil has been spreading up from year to year. It is estimated that the annual cost of erosion amounts to at least $400,000,000 in directly depreciated soil values, not to count the ultimate cost in terms of land destroyed or impoverished, in the resultant silting of reservoirs, streams, and harbors; increased volume and frequency of floods, damage to low-lying fields by overwash of infertile erosional debris, and the impoverishment of farming populations. At least 35,000,000 acres of formerly valuable cultivated land already have been essentially ruined insofar as further practical crop use is concerned; and 125,000,000 additional acres, most of them still in cultivation, have been largely stripped of the productive topsoil, with a resultant decline in productivity ranging up to 90 percent. At least 100,000,000 acres of our remaining valuable agricultural lands are heading rapidly in the direction of land stripped of its topsoil, and thus are being transformed into marginal and submarginal land.

The most conservative estimates, such as leave out of consideration flood damage and the costly problem of silting of reservoirs and

streams, indicate that the full value of land impoverished and destroyed, together with the losses incurred through the creation of stranded populations, already amounts to not less than $10,000,000,000. Actually, the cost has been much greater than this. It is not possible to calculate the financial equivalent of losses incurred through the destruction of the prosperity of whole regions, the disruption of farming communities, and the scattering of their populations by way of throwing hundreds of thousands of persons upon relief rolls or into a condition of meager subsistence obtained through bankrupt farming on erosion-depleted land. Neither is it possible to calculate the value which the 160,000,000 acres of formerly productive farm land, now either devastated or vastly reduced in value, would have at some future time under conditions of increased population, such as might call for the utilization of every possible productive acre.

Unless the evil is curbed in a far-reaching way, the possible losses from erosion during the next 50 years are obviously enormous. The annual $400,000,000 direct loss in soil values washed away alone would accumulate to probably not less than $20,000,000,000. To this would have to be added the values of, (1) great reservoirs filled with the products of erosion, (2) the unmeasurable cost to the Nation of economic disaster to irrigated areas dependent on such reservoirs, (3) transfer to relief rolls of tremendous farm populations, (4) virtual abandonment of large agricultural sections, and (5) economic devastation of large western areas dependent on grazing. Furthermore, within something like 50 to 75 years an estimated area of about 250,000,000 acres of valuable agricultural land will either have been essentially ruined insofar as further important agricultural use is concerned, or will have had its productivity reduced by from 30 to 90 percent. There would then remain not a great deal in excess of 150,000,000 acres of fully productive agricultural land; an area which might be insufficient to support adequately the population of the country. From a future point of view, the value of lands destroyed and impoverished by erosion probably will be measured not so much in terms of present market value as in terms of the value of the land plus the human values involved. If the evil of unrestrained erosion is permitted to continue, it is possible to predict with a considerable degree of mathematical certainty the time when American standards of living will begin to decline.

CHARACTER OF PROGRAM

To meet the threatening situation involved with this wastage of our most basic national resource, the Soil Erosion Service has established a series of representative watershed demonstration areas within the different major geographic and agricultural regions of the country where destructive erosion is prevalent. In each area there

has been set up a staff of specialists experienced in the technical aspects of erosion, land, agronomy, forestry, etc., who are rapidly getting under way a practical program of erosion control, seeking not only to protect the land but to increase the absorption of rainfall and to reduce the hazards of floods and silting. This program differs from any other ever undertaken in this country. The plan of procedure is not one of employing single and unsupported implements of attack, but it is definitely one wherein all practical measures of erosion control (which involves control of run-off by increasing absorption of the rainfall) are utilized in a coordinated, correct land-use program. This is not an agronomic program or a soils, forestry, or engineering program, but a program employing all of these measures in accordance with the needs and adaptability of every acre of land requiring treatment, so coordinated that the integrated activities will support one another to effect complete control of the erosion, flood, and silting problems of entire watersheds. Necessarily then, it is definitely an experimental-demonstrational procedure, since if the work succeeds in reducing silting or in minimizing the flood hazard, as a supplemental accomplishment to the primary purpose of erosion control, here will be for the first time in our history an example, experimentally determined, of the practical possibilities of focusing all our technical knowledge against the greatest destroyer of soil values and one of the principal contributors to increased floods and silting.

The procedure followed in the establishment and operation of typical demonstration watershed projects involves the following steps:

(*a*) The project areas are carefully selected, consideration being given to the representative character of the problems presented therein, their suitability to the application of a unified, well-conceived, effective program of land treatment, and the willingness of the farmers and land owners to cooperate in and help carry out the work. The regional directors are selected on the basis of long experience in related fields of activity, such as executive ability, and knowledge of the local soils, agriculture, and climatic conditions. Each director is provided with a competent staff of agronomists, soil specialists, agricultural engineers, and other technicians.

(*b*) The watershed projects, the regional directors and their staffs having been selected, the next step involves the preparation of a comprehensive practical plan for the control of erosion and reduction of floods and silting over all the lands within the watershed areas. This plan is based on the physical and chemical characteristics of the soils involved, the slopes, the climate, the vegetation, adaptable crops, and the agricultural practices of the areas, and applies all known methods of control, chosen for their particular adaptability to the particular situation. In the detailed plans careful considera-

tion is given to the needs of the farm as an economic unit in order that the property owners may not suffer financial loss and that their enthusiastic cooperation may be obtained.

(*c*) On the basis of carefully prepared land-use plans, 5-year agreements are entered into between the property owners or operators and the Government, whereby the owners or operators agree to carry out the land-use practices advocated by the Soil Erosion Service and to contribute certain labor and materials necessary for construction and installation of control devices, such as check dams, strip crops, terraces, contour furrows, new fences, and relocated fences. In return for these undertakings by the owners or operators the Government agrees to lay out the work, to provide the supplementary labor and material (which the farmer cannot supply) needed to put the cooperatively approved plan into operation, and to furnish seed, trees, and shrubs for the planting of areas taken out of cultivation because of their highly erosive character and consequent dangerous relation to good lands lying below.

(*d*) Upon the completion of the cooperative agreements, actual field work gets under way and the plans are put into effect as rapidly as is permitted by the local climatic and agricultural conditions.

An important phase of the program relates to the establishment of practical methods for the utilization of marginal and submarginal lands, since such lands must be retired from cultivation if erosion is to be effectively controlled. When this type of land occurs in a scattered fashion interspersed with productive fields, it is being planted to pasture or trees in such a manner as will make possible the production of supplementary income to replace that which the owners or operators formerly obtained through cropping and other land-use practices that caused exhaustion of their capital land assets. Where practicable, types of vegetation are utilized which furnish a food supply and coverts for the development of game resources, such as the farmers may make profitable use of by way of disposing of hunting privileges.

A much more difficult land-utilization problem is presented in those regions where marginal and submarginal lands exist in such large blocks that they cannot be profitably operated under private and individual ownership. Where such areas occur, it is the present plan to encourage their purchase by the Federal Government, the States, or the local communities, and to establish thereon State, country, or municipal forest or grazing reserves. These forests, if operated on a perpetual yield basis, would not only control erosion, but would also furnish a stable source of local employment to a considerable percentage of those impoverished farmers now living on the lands which would be purchased.

The object of the erosion-control demonstration areas is to put into practice those measures of control and correct land-use which have been established as effective regional implements of control through experiment and practice. There arise, however, problems and questions which require investigation and special studies if the measures are to be successful to the highest degree. Accordingly, in cooperation with other Federal agencies and with certain non-Federal agencies, the Soil Erosion Service has inaugurated investigations and experiments dealing with (1) the relations between rainfall, stream flow, and water-table levels, on the one hand, and land-use practices on the other; (2) the amount, intensity, and duration of rainfall within the project areas; (3) deposition of eroded material over flood plains and in streams and reservoirs; (4) establishment of geologic norms of erosion; (5) development of new and more economical or efficient methods of controlling erosion; and (6) the effect of soil erosion and erosion-control work on economic and social conditions. It is obvious that adequate information must be obtained on all of these subjects if erosion-control programs are to be carried out on the most practical and economic basis.

THE STATUS OF THE PROGRAM AS OF JUNE 30, 1934

The Soil Erosion Service was established in October 1933 with an initial grant of $5,000,000 from the Federal Emergency Administration of Public Works. An additional grant of $5,000,000 became available for expenditure during March 1934. The first few weeks of the organization's existence were occupied with the strenuous efforts of developing an effective administrative and technical staff. The first project was established in Coon Valley, Wis., in November 1933. Thereafter additional projects were established as rapidly as areas could be selected and adequate operative organizations set up, until in January 1934, with the establishment of project no. 10, on the Navajo Indian Reservation, sufficient work had been undertaken to obligate the first $5,000,000 allotment. No additional projects were established until after the second $5,000,000 allotment became available. The first of this second group of projects went into operation in March 1934 on the Muskingum Watershed in Ohio. Additional projects were established with comparative rapidity until the setting up of project no. 24, the latter part of April, had exhausted the second allotment, although, of course, a sufficient reserve was kept to provide for unforeseen contingencies and to carry out special surveys and to develop plans as need might arise.

Demonstration watershed projects.—Twenty of these projects were under way, varying in size from 25,000 to 200,000 acres, covering a total area of 2,620,000 acres. Each project involves such reorganization of land-use practices and the installation of such measures as are

needed to control both wind and water erosion, conserve water, control floods, and place farming on a practical perpetual-yield basis. Thirteen percent of the total work to be done under this allotment had been completed, 157,000 acres having been put under control on 2,178 farms. Out of allotments totaling $7,050,000, $1,066,635 had been spent or obligated. In evaluating these figures consideration should be given to the fact that 11 of the projects were established with funds which did not become available until March 1934, and that considerable time is required to complete necessary planning operations before a project gets into full operation. The element of crops already planted necessarily enters into the speed with which erosion-control operations can be put into effect, since certain phases of the work cannot get under way until the crops are harvested.

Projects on federally controlled land.—Two of these projects had been established, one on the Navajo Indian Reservation with an area of 15,000,000 acres, and one on the Gila River Watershed in Arizona and New Mexico, with an area of 8,200,000 acres. The Navajo project is on lands which contribute vast quantities of silt to Boulder Dam, and involves the preparation and application of comprehensive erosion-control, land-use and range-control measures. It also involves the reorientation of the entire agricultural-economic system of 45,000 Navajo Indians. This project was allotted $1,000,000 of which $284,711.14 had been expended or obligated. The completion of the work will require years and additional funds. The Gila project involves seriously eroded lands which contribute great quantities of silt to the Coolidge Reservoir. The work has been initiated with Civil Works Administration and Emergency Conservation Work labor, under supervision of the Soil Erosion Service. It is estimated that at least $5,000,000 will be required to complete the stabilization of this important area.

Experimental and erosion-survey projects.—Two of these projects had been established, one in New York and one in Pennsylvania. These are regions in which erosion factors and methods of control are little understood. The New York and the Pennsylvania projects were about 5 percent completed. A proposed project in the Tennessee Valley had been held up by difficulties of land acquisition, and the funds for it may have to be reallotted.

Cooperation with the Civil Works Administration and the Director Emergency Conservation Works.—From December 15 to May 1 large numbers of Civil Works Administration laborers were utilized on the various projects. The most outstanding work being done on the Gila River Watershed in Arizona. Beginning with the current period, 22 Emergency Conservation Work camps were assigned to the Soil Erosion Service. Recent assignments of additional regular and

drought relief camps have increased to 51 the number of erosion camps being supervised.

Financial status.—Total expenditures and obligations of the Soil Erosion Service to June 30, 1934, were $1,519,461.60 out of a total allotment of $10,000,000. It is estimated that the remaining funds will be required for the completion of the projects now in operation. It should be pointed out that heaviest expenditures for equipment and material were made during the initial stages of the program and that hereafter relatively small expenditures will be required for this purpose, with larger expenditures devoted to employment.

Employment.—On June 30, 1934, 2,200 persons were employed by the Soil Erosion Service and approximately 5,744 man-months of employment had been furnished by the program since its inception. With the establishment of projects under the second $5,000,000 grant, the curve of employment began to rise much more rapidly and it is expected to reach a peak employment of 6,500 some time in October or November. Thereafter, the curve will probably drop somewhat due to the difficulty of performing field work in cold weather. It will rise again during the spring of 1935.

THE FUTURE OF EROSION CONTROL

It will be impossible to maintain permanent prosperity over large areas of the United States if the present rapid destruction and impoverishment of our most valuable agricultural lands by accelerated erosion is permitted to continue. This process seriously threatens the welfare of large farming populations and, eventually, will result in the virtual abandonment of large regions and serious impairment of standards of living in other parts of the country, if not vigorously combated without further delay.

These conclusions are not merely expressions of opinion, but rather statements based on physically determined facts. The remedial step that inevitably must be taken is the application of a coordinated land-use and land-protection program applied in accordance with the specific needs and adaptabilities of all valuable land needing treatment. There can be no alternative, and the seeking of one will mean merely the putting off of those things which must be done, with a consequently enlarged and more difficult and costly job pushed off into the future. Whatever may be the wishes or inclinations of the people of the country, this task of increasing land destruction and impairment must be fought from now on. This enemy to the continuing welfare of the nation is out in the open and can never again be driven back into cover by essays, round-table discussions, and the academic opinions of those who do not know the land, what is taking place on it and what must be done to save it. Actually the job of control is one of the most difficult that mankind ever undertook, and

in America it is by far the most pressingly important undertaking standing out ahead of us—one that grows more difficult to handle, as well as more costly, with every succeeding rain heavy enough to cause water to run down hill across unprotected slopes. It can be handled only by pooling the best brains of our specialists (of whom there are pitifully few), who know the multiplicity of soil conditions stretching across the country, their anatomical constitution, their numerous differing susceptibilities to erosional impairment and their imminent needs, as determined by their physical characteristics. With determined leadership, adequate funds and national understanding of the importance of overcoming the evil, the battle can be won. Without these things it cannot be won.

The entire problem of erosion control and watershed stabilization is so complex and wide-spread, and the chances for doing ineffective work which would destroy public confidence in the program are so great, it seems evident that the Federal Government must take the initiative in inaugurating and carrying out an adequate national land-use and land-protection program. Furthermore, the problem is interstate in character and its most threatening aspects relate equally as much to national welfare as to the welfare of States, communities, or individuals. Land misuse in the upper Missouri Valley may well contribute to flood damage along the lower reaches of the Mississippi River. Watershed denudation in New Mexico contributes to destructive floods and the silting of Federal reservoirs in Arizona. The creation of stranded farm populations on erosion-depleted land necessitates vast expenditures for relief purposes by the Federal Government. The intensified character of drought damage in the Midwest due to unnecessary loss of rainwater through accelerated run-off is reflected in the increased price of foods throughout the entire Nation. The Federal Government spends vast sums to reduce crop surpluses, much of which is produced on highly erosive lands that would be removed from cultivation under any intelligent land-use program. Examples of the effect of land misuse on national welfare could be multiplied indefinitely.

The acceptance by the Federal Government of the main responsibility for initiating and carrying out a Nation-wide land-use and erosion-control program would not in any way imply that the States, their minor subdivisions, and the property owners concerned should not play a highly important part in the work. In fact it is almost essential that they should play such a part and that they should provide a fair share of the necessary funds. The States in particular would have to be brought into close cooperation, since in them rests the power to tax and to establish zoning regulations required to control the use and misuse of land. An arrangement will need to be worked out under which the States and the Nation jointly share the responsi-

bility for the program but with the technical control and the general guidance of the work left in the hands of the Federal Government.

Any permanently effective land-use and erosion-control program will probably have to contain the following essential elements:

(1) The establishment of national, State, or local land-use zoning ordinances which will prohibit those types of land misuse which contribute to erosion and the production of floods.

(2) The conditioning of Federal grants for the control of erosion upon the establishment of suitable zoning regulations.

(3) The purchase by the Federal or State governments, or by local communities, of marginal and submarginal lands to be used as national, State, or community forests and grazing areas.

(4) The establishment of suitable mechanisms for the assessment of costs incurred in rehabilitating land and the determination of those percentages which must be contributed by the Federal Government, the States, the local communities, and the landowners, respectively.

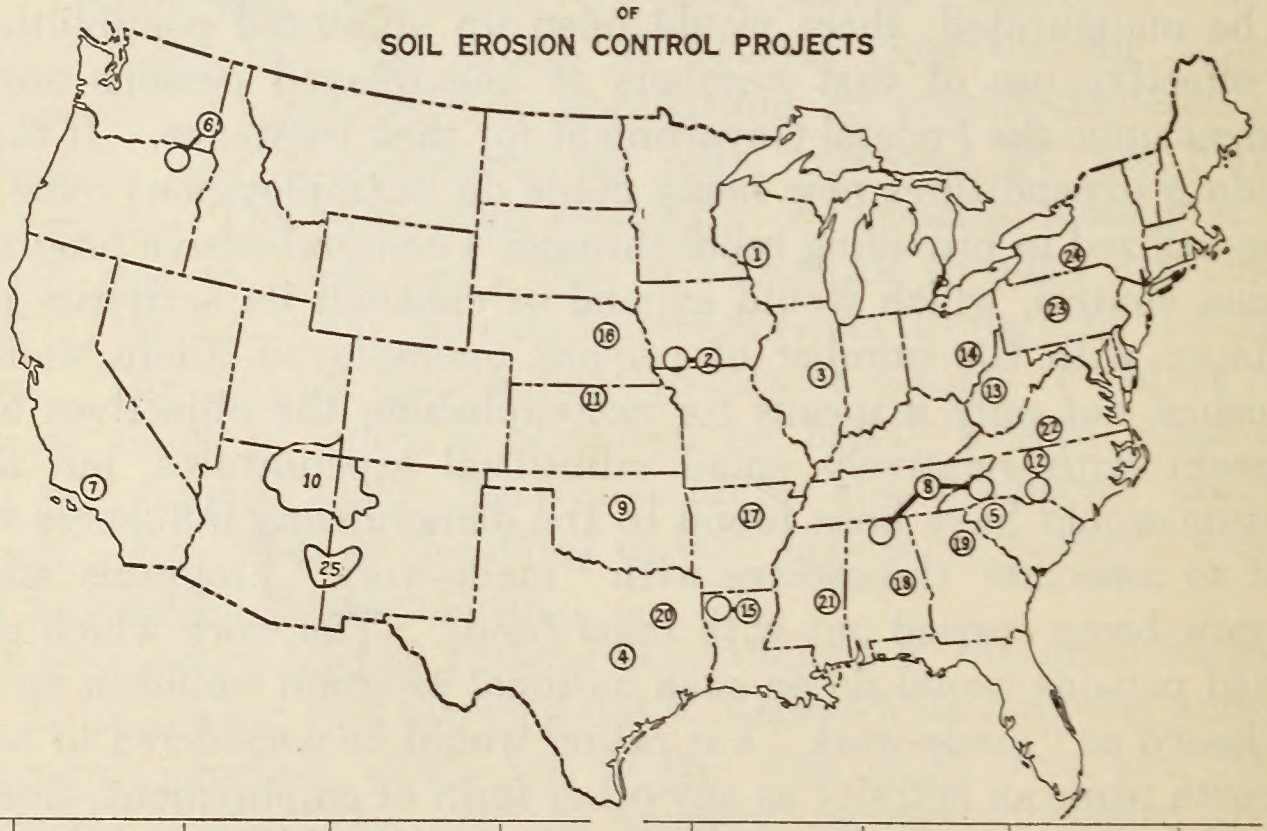
(5) The organization of the program in such a manner that it will utilize effectively and in a productive fashion the large amounts of relief labor which apparently will be available in this country for many years; plans to be completed well in advance of actual construction so that the program could be rapidly expanded and contracted as the needs of the unemployment situation might dictate.

Should a permanent national program of erosion control and land use be inaugurated, there would open up unlimited possibilities for the effective use of vast numbers of unemployed persons now dependent upon the Federal Government for their existence. If the tremendous expenditures now being made on unemployment relief were to be utilized in providing relief through a comprehensive program of erosion control, which would expand or contract its activities in accordance with the number of persons unemployed, there would be furnished not only a means for accomplishing the objectives of the program with relatively small additional expenditures, but also a solution would have been found to the demoralizing influences which tend to associate themselves with "made-work" programs such as are now being carried out with relief funds. The work which unemployed persons would do on such national program would in no sense be classed as "made-work" but rather would be considered to be just as worth while an activity as any other form of employment, since the objectives, quite aside from the purpose of providing employment, would be of paramount national importance. Such work would create values and improve and restore productivity to land resources. If the program were extended over a long period of years, it would afford exciting new fields of endeavor to the graduates of our technical schools who are now so largely either unemployed or engaged in uninteresting work.

Tabulation showing accomplishments of the soil-erosion service as of June 30, 1934

Acres surveyed by aerial methods	20, 102, 000
Acres surveyed for soils, slope, and erosions	1, 525, 052
Farms surveyed and mapped for soils, slope, and erosion	3, 925
Acres of ultra extensive range reconnaissance completed	17, 200, 000
Acres of extensive range reconnaissance completed	67, 000
Acres planned for land use and erosion control	430, 724
Farms planned for land use and erosion control	2, 647
Cooperative agreements signed	2, 108
Acres covered by cooperative agreements	433, 168
Farms covered by cooperative agreements	2, 179
Acres on which erosion was controlled	157, 960
Acres agreed to be retired from cultivation	24, 562
Acres agreed to be strip-cropped	42, 022
Acres actually strip-cropped, June 30, 1934	28, 850
Acres agreed to be terraced	48, 166
Acres actually terraced on June 30, 1934	26, 278
Acres agreed to be contour-furrowed	9, 414
Acres actually contour-furrowed	4, 403
Gully-control structures built	23, 831
Acres protected by gully-control structures actually built	43, 348
Number of trees planted	3, 213, 517
Acres planted to erosion-resisting crops	61, 901
Acres on which erosion-resisting crop rotations agreed	181, 859
Acres on which erosion-resisting crop rotations underway	151, 899

LOCATION OF SOIL EROSION CONTROL PROJECTS



Project No.	Name of Project	Regional Director	Office Location	Approx. Acres
1	Coon Creek	R. H. Davis	La Crosse, Wis	100,000
2	West Tarkio River	R. E. Uhland	Bethany, Mo	175,000
	Big Creek			150,000
3	Sangamon River	F. A. Fisher	Urbana, Ill	140,000
4	Elm Creek	H. V. Geib	Temple, Tex	200,000
5	South Tiger River	T. S. Buie	Spartanburg, S. C	125,000
6	Wildhorse Creek	W. A. Rockie	Pullman, Wash	50,000
	South Palouse River			150,000
7	Arroyo Las Posas	Harry Reddick	Santa Paula, Calif	25,000
8	Tennessee Valley	C. B. Manifold	Knoxville, Tenn	
9	Stillwater Creek	N. E. Winters	Stillwater, Okla	150,000
10	Navajo	H. G. Calkins	Albuquerque, N. Mex	16,000,000
11	Limestone Creek	F. L. Duley	Mankato, Kans	150,000
12	Deep River	J. H. Stallings	High Point, N. C	90,000
	Brown Creek			70,000

Project No.	Name of Project	Regional Director	Office Location	Approx. Areas
13	Reedy Creek	Max M. Hoover	Spencer, W. Va	100,000
14	Salt Creek	J. S. Cutler	Zanesville, Ohio	100,000
15	Cooley Creek	A. H. Meyer	Minden, La	100,000
	Cypress Creek			47,000
16	Plum Creek	R. L. von Trebra	Albion, Nebr	70,000
17	East Cadron Creek	Fred C. Newport	Conway, Ark	125,000
18	Buck & Sandy Creeks	R. Y. Bailey	Dadeville, Ala	110,000
19	Sandy Creek	Loy E. Rast	Athens, Ga	100,000
20	Duck Creek	L. P. Merrill	Lindale, Tex	25,000
21	Okatibbee River	C. B. Anders	Meridian, Miss	150,000
22	Banister River	S. F. Grubbs	Chatham, Va	100,000
23	Soil Erosion Survey	A. L. Patrick	State College, Pa	
24	Soil Erosion Survey	F. B. Nowe, Acting	Ithaca, N. Y	
25	Gila River	B. P. Fleming	Safford, Ariz	8,200,000

Soil Erosion Service, Department of the Interior tabulation showing financial status of program employment and Emergency Conservation Work camp assignments as of June 30, 1934

Project no.	State	Date established	Allotment	Expended and obligated June 30, 1934	Estimated total man-months employment to be furnished	To June 30, man-months of employment furnished	Number persons employed June 30, 1934	Number Emergency Conservation Work camps assigned to project
	Washington administration		$225,000	$134,865.08		134	79	
1	Wisconsin	Nov. 1933	300,000	133,795.69	2,142	808	70	1
2	Missouri	do	650,000	118,714.62	4,641	278	110	8
3	Illinois	Dec. 1933	300,000	98,860.82	2,142	253	54	4
4	Temple, Tex	Nov. 1933	350,000	41,243.91	2,499	135	43	2
5	South Carolina	do	350,000	83,893,20	2,499	374	191	3
6	Washington	Dec. 1933	350,000	62,667.45	2,499	197	80	1
7	California	do	175,000	24,304.71	1,428	180	111	3
8	Tennessee	Apr. 1934	300,000	9,711.19	2,142	21	5	
9	Oklahoma	Dec. 1933	350,000	129,637.55	2,499	930	427	3
10	Navajo	Jan. 1934	1,000,000	284,711.14	7,140	1,200	432	
10A	Arizona [1]							5
	New Mexico [1] [2]							
11	Kansas	Dec. 1933	300,000	72,511.51	2,142	246	80	3
12	North Carolina	Feb. 1934	650,000	47,417.46	4,641	117	50	3
13	West Virginia	Apr. 1934	300,000	28,875.32	1,428	96	84	2
14	Ohio	Mar. 1934	425,000	30,042.28	3,034	91	57	2
15	Louisiana	do	500,000	36,957.59	3,570	113	104	1
16	Nebraska	do	275,000	31,698.82	1,943	57	32	2
17	Arkansas	Apr. 1934	300,000	13,879.48	2,142	281	52	1
18	Alabama	do	300,000	25,192.53	2,142	33	22	3
19	Georgia	Mar. 1934	300,000	21,764.26	2,142	22	17	1
20	Lindale, Tex	Apr. 1934	150,000	15,656.93	1,071	11	11	1
21	Mississippi	do	350,000	22,362.36	2,499	45	39	1
22	Virginia	do	350,000	17,448.20	2,499	36	19	1
23	Pennsylvania	do	50,000	5,006.07	357	28	25	
24	New York	do	50,000	3,885.48	357	8	6	
	Century of Progress		10,000	457.26				
	Reserve fund for equipment		50,000	24,391.69				
	Total		8,635,000	1,519,952.60	59,598	5,744	2,200	51
	Reserved for distribution as project needs develop		1,365,000					

[1] Gila River.
[2] Emergency Conservation Work and Civil Works Administration project only.

ST. ELIZABETHS HOSPITAL

(William A. White, M.D., Superintendent)

MOVEMENT OF POPULATION

On June 30, 1934, 5,191 patients remained in the hospital as compared with 4,981 on June 30, 1933, an increase of 210. This is accounted for by a relatively large number admitted and a smaller number of deaths and discharges than usual.

The total number of patients under treatment during the year was 5,875, as compared with 5,841 for the preceding year, an increase of 34.

The total number of admissions during the year was 894, as compared with 911 the preceding year, a decrease of 17.

The total number of discharges for the year was 426, as compared with 582 for the preceding year, a decrease of 156. Included in the large number of discharges during the year 1933 were over 100 patients transferred to Veterans' Administration Facilities, and about 40 transferred to the Department of Justice hospital at Springfield, Mo.

The total number of deaths for the year was 258, as compared with 278 for the preceding year, a decrease of 20, or approximately 8 percent.

The total number of discharges and deaths, combined, was 684, compared with 860 for the preceding year, a decrease of 176, or about 20 percent.

There were 57 burials in the hospital cemetery, as compared with 61 the preceding year. With the cooperation of the War Department the bodies of 3 service men, honorably discharged, were buried in the Arlington National Cemetery without direct money outlay; and 34 bodies were buried in Arlington Cemetery either at Federal or private expense, by outside undertakers. The remaining 164 bodies were taken for burial in various other cemeteries throughout the United States, one having been shipped to the Philippine Islands.

The daily average patient population was 5,049, an increase of 13 over the 5,036 for the preceding year.

Movement of patient population, fiscal year 1934

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1933	2,625	753	3,378	954	649	1,603	4,981
Admitted during year ended June 30, 1934	437	129	566	226	102	328	894
Total number under care and treatment during year ended June 30, 1934	3,062	882	3,944	1,180	751	1,931	5,875
Discharged as—							
Not insane	7	2	9	0	1	1	10
Recovered	74	19	93	17	11	28	121
Improved	93	25	118	12	8	20	138
Unimproved	106	33	139	13	5	18	157
Total discharged	280	79	359	42	25	67	426
Died	111	56	167	50	41	91	258
Total of patients discharged and died	391	135	526	92	66	158	684
Number of patients remaining on rolls June 30, 1934	2,671	747	3,418	1,088	685	1,773	5,191

ADMINISTRATIVE DEPARTMENT

OFFICE OF THE ASSISTANT TO THE SUPERINTENDENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products such as potatoes, tomatoes, beans, parsley, spinach, squash, turnips, etc., were 273,426 gallons of milk, 112,265 pounds of fresh pork, 12,910 dozen eggs, 6,024 pounds of chicken, etc., 15,224 pairs of shoes and slippers, 5,781 brooms, 2,337 brushes, 800,000 loaves of bread, 3,200,000 rolls, 90,000 pounds of pastry, 2,215 mattresses, 2,055 pillows, 22,736 gallons of ice cream, and the laundering of 10,745,726 articles, in addition to hundreds of other items.

Amongst the items raised on the farm, in addition to the garden products, were 1,000 tons of ensilage corn, 88 tons of alfalfa hay, 30 tons of green hay, 71 tons of sudan grass and soybean hay, 75 tons of miscellaneous hay, and 1,000 bushels of ear corn.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops. The patients on the wards, under the direction of occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, and assisted in making stand covers, screen covers, tablecloths and other items.

All the steam, electricity, ice, and refrigeration used on the reservation was manufactured in the hospital shops.

Printing department.—As explained in the last report, a new electric press has been purchased for use and is being operated by an occupational therapist, with the hope of training some of the patients to assist in this work. It is believed the use of patients on the

presses will have a therapeutic value. During the past year there were turned out 105,000 copies of various classes of printed matter.

Dairy and cow barn.—The Holstein-Friesian herd has again been tested for tuberculosis and there were no reactions. The herd consists of 250 cows, 9 bulls, 92 heifers, and 63 calves, a total of 414 animals. This is the twentieth year that there have been no reactions from tuberculosis and is very satisfactory, as this is one of the largest accredited herds in the country.

Bang abortion disease manifested itself in the herd in 1932, and while in a way it has been eliminated it made a sudden reappearance during the past 3 months of the fiscal year, not in the matter of the number of cows aborting but in the agglutination reaction of the blood of five cows that aborted during the year. All cows have been bled several times by the United States Department of Agriculture, cooperating with the hospital in limiting the spread of this disease and as far as possible removing all those showing reactions.

The herd produced 273,426 gallons of milk during the past year, about 6 percent less than the previous year. The herd gave an average production of about 12,000 pounds of butter a year.

The quality of the milk, as indicated by about 25 bacteria counts, has been highly satisfactory, the average, well below 10,000 colonies per cubic centimeter (average about 6,800) being well within the requirements for certified milk.

The hospital continues to cooperate with the United States Department of Agriculture in the use of purebred bulls from its Beltsville (Md.) Experimental Station.

Piggery.—The hospital slaughtered 402 hogs during the year, which furnished 112,265 pounds of dressed pork, 38,000 pounds less than during the previous year. The reduction in the amount of pork deliveries was due to the fact that the piggery has not yet fully recovered from the depletion of the breeding stock due to porcine abortion reported 2 or 3 years ago. However, with the 406 hogs now ready for slaughter this fall and 365 spring pigs intended for slaughter by February, the prospect for a good supply of pork for the coming year is promising.

Farm and garden.—The weather conditions played a great part in slowing up production, especially of the garden products. Of the vegetables, carrots, turnips, Swiss chard, beans, cucumbers, eggplant, tomatoes, and cymlings, among others, made a rather poor showing, but the prospect for a good crop in each of these products would seem to be much better at the present writing, provided that the summer of 1934 does not have a drought. Onions, on the other hand, will be short during 1934 because of severe weather killing most of the onion

sets stored. Rhubarb has not measured up to expectations due to unfavorable conditions.

Diet.—The hospital continues the study of the diet. Not only is a greater variety of food being served to the patients and a larger variety of greens continued throughout the year, but efforts are being made to see that the food served is in a more appetizing manner.

Detached kitchen, Toner kitchen, superintendent's kitchen, and A kitchen have been equipped with gas ranges. These replace old worn-out coal-heated ranges and ovens; at the present time all of the kitchens are equipped with gas ranges, and there are no coal ranges on the reservation. This has the effect of expediting the meals, results in economy, and makes for better working conditions in the kitchens, especially in the summertime.

Cafeteria equipment has been purchased for the West Lodge dining room which will add 400 patients to those being fed by the cafeteria system. Plans are being drawn to equip the detached dining hall and the semipermanent dining rooms with cafeteria equipment, such as steam tables, etc., so that the patients fed in these dining rooms may use the cafeteria system. At the present time about 2,000 patients in the hospital are being fed through full or partial cafeteria system methods.

The kitchen furnishing food for the semipermanent group of patients, about 500, having been in use about 15 years, has become so dilapidated that it became necessary either to rebuild or replace it. The cost of rebuilding or replacing was more than the available funds. Under such conditions it was found of advantage to close this kitchen and feed the 500 patients of the semipermanent group from the continuous treatment kitchen. The total number now being fed from this continuous treatment kitchen is about 1,400 patients, about equal to those fed from the general kitchen.

The general kitchen has been painted. The scullery, toilet, and locker rooms in the detached kitchen have been painted. A dishwasher has been ordered for Oaks A dining room. Toner dining room has been painted, and the kitchen is now being painted. New dressing rooms, toilets, and showers are being installed at the employees' cafeteria.

The dietitians gave their regular course to the student nurses of the regular class, in addition to affiliate nurses from the Portsmouth Hospital and from the Children's Hospital, of Washington, D.C.

Ice cream and pastuerizing plant.—A total of 273,426 gallons of milk, or a daily average of 749 gallons, was clarified and pasteurized at 148° F., and cooled immediately to 42° F., when more than one-half was bottled for distribution to patients and the remainder issued in cans for use in the kitchens for cooking, baking, and for making ice cream.

Approximately 20 gallons of buttermilk were made daily and issued to the various kitchens.

A total of 22,736 gallons of ice cream, or a daily average of 62 gallons, was made.

Bakery.—The hospital installed a bread-cutting machine that permitted the slicing of bread before being wrapped and sent from the bakery. This does away with bread-cutting machines in the larger dining rooms and the possible handling of knives by patients in the smaller dining rooms, minimizing the danger from such conditions. It would also have a tendency of keeping the bread fresh for a longer period, as the bread being wrapped in paraffin paper after being sliced it is not necessary to open the paraffin paper until the bread is actually required to be used.

The output of bread during the year was 800,000 loaves, with 3,200,000 rolls and 90,000 pounds of pastry.

New tile floors have been put in the bakery hall and bread-cooling room to replace wooden floors.

Laundry.—The work of the laundry continues to increase. The number of pieces laundered during the year was 10,745,726, about 850,000 increase over the previous year. Notwithstanding this increase, during the year there has not been an increase among the paid employees.

Four double presses, two double sleeve ironers, and one 120-inch tumbler dryer have been added to the equipment in order to meet the increased production.

Shoe shop.—The work in the shoe shop continues to increase. This work furnished employment to about 38 patients for about 5½ hours each day, except Saturdays and recreation days. During the past year there were manufactured in this shop 5,514 pairs of house slippers; 3,989 pairs of men's oxfords; 2,514 pairs of men's high shoes; 918 pairs of brogans; 1,088 pairs of women's oxfords; 1,043 pairs of women's strap slippers; 202 pairs of women's house slippers, and 1,643 pairs of shoes were repaired. In addition to that, in the same shop there were made 2,337 brushes of all classes.

Additional machines have been installed in this shop for making belts, suspenders, and mats out of waste material.

Lawns and grounds.—The grounds adjoining the continuous treatment buildings and the south side of the tuberculosis building recently constructed have been regraded and sown with grass seed and 98 holes dug and filled with soil for planting of trees. It is planned to put in about 200 trees in the section around the new buildings this fall.

Fires.—There were several small fires without financial damage during the year. Fire extinguishers have been installed in all the new buildings, and regular fire inspections made of every building in the hospital during the year. Inspections have also been made of fire

hydrants, fire escapes, and frequent fire drills, which included the emptying of the buildings, have been part of the regular work of the fire department.

Automatic telephones.—The number of calls during the year over the automatic telephones were 1,369,458, a daily average of 3,751, or an hourly average of 156.

Construction.—A tunnel to contain the steam pipes and electric conduits to connect with the new male receiving building has been completed.

The wooden floor construction of porches at both ends of P building has been replaced with new floors of reinforced concrete, using a quarry tile finish.

The old dairy barn has been entirely reconditioned by removing the wooden floor and wooden beams and replacing same with reinforced concrete and beams. This barn was provided with gutters and floor drains for cleaning; also a concrete manger and feed troughs. Metal stanchions, pens, and gates were installed. An extension was built to the bull pen and yard to accommodate four additional bulls.

The old steam pipe tunnel under Nichols Avenue, to the north of the subway, became cracked and showed evidence of crumbling in several places due to the vibration of traffic from above. This was relined with reinforced concrete.

Gas mains were laid from the circulating library to Toner kitchen and to the detached kitchen. Also from Nichols Avenue to the A kitchen.

One thousand and twenty-six square feet of wood floor in the bakery was reconstructed and replaced with reinforced concrete, using quarry tile finish for floors.

The tile flooring in the dishwashing room of the detached dining room was replaced.

A steam pipe tunnel was built large enough to contain electric conduits to connect with the new female receiving building.

The third floor of the laundry was remodeled, and the repair room moved to this floor. Changes were made on the second floor to increase space required for the new pressing machines purchased, the room formerly occupied by the repair shop permitting increased space for sorting clothes.

Continuous-treatment building no. 2 has been provided with a hospital radio and a speaker on each ward.

Twenty-six automatic telephones have been installed throughout the new male receiving building.

Four thousand six hundred and thirty-five feet of 100-pair and 791 feet of 50-pair lead covered telephone cable has been placed in the hospital system. This cable extends from the shops building tele-

phone main distribution frame to what is known as N building, on the east side of Nichols Avenue.

Installation of an outlet on the south side of the refrigeration plant to flood the new stack has been completed. The Department of Commerce maintenance man advises that the Department intends to install brackets and move one of the two flood lights now located on the roof of the power house to this new location. This is for protection of the various aviators who are flying in this direction at night.

The work of remodeling the power house has been completed. The east boiler room was extended 30 feet, and the side walls of the old part were raised 16 feet to accommodate the space required for new and larger boilers. Metal casement windows were installed in all walls extended, which will afford additional ventilation. Approximately 200,000 bricks were used in this extension. The roof consists of reinforced concrete slab with a tar and gravel finish. The center section of the roof was provided with a monitor ventilator with pivoted metal sash to afford ventilation immediately over the boilers.

A reinforced concrete floor was built in the new boiler room at an elevation of the firing floor.

A trench was dug through the old boiler room and lined with concrete to provide for an ash discharge pipe; also a similar line under the combustion chambers in the rear of these boilers. A 12-inch drain line was laid through this room to provide drainage from the boiler rooms. The drainage line had to be relocated on account of the concrete coal silos which had been erected on the outside of the building.

Separate contracts were approved as follows: (1) For razing the old boiler room and foundation of new stack; (2) for three 750 horsepower boilers; (3) for stokers and equipment connected with boilers; (4) for iron work, floors, etc., connected with boiler room; (5) for piping of boilers; (6) for new heaters; (7) for a new stack, duplicate of the old stack; (8) for coal handling machinery, silos, etc.; (9) for ash handling machinery, vacuum system for withdrawing ashes, etc.; and (10) for two new pumps.

Practically all of this work has been completed and accepted, except the two pumps and some work on the vacuum ash handling machinery. In connection with this work, additional sewer lines, water lines, steam lines, toilets, lavatories, shower baths, and other installations were required for the use of the employees and to put the buildings in proper repair.

Public Works projects.—The Administration of Public Works allotted money to the hospital for a new female receiving building and for 13 reconditioning projects. Contracts have been awarded for the new female receiving building, and this work is now under process. It has been delayed to a great extent by strikes and trouble incident to the driving of piles. The work of pile driving is now proceeding under

3 shifts of labor, and as soon as this is completed the contractor has been directed to put on 2 shifts of men in order to expedite the completion of this work.

The reconditioning projects are as follows:

Federal project no. 2.—Install screens and grilles in continuous treatment buildings. This provided grilles over stairways to prevent patients from jumping or falling and resulting in accidents and screens in corridors and around radiators, for the proper protection of the patients. This work has practically been completed.

Federal project no. 3.—Roads and walks around continuous-treatment buildings, new buildings just constructed. This work has just been completed.

Federal project no. 4.—Roads and walks around male receiving building, a new building just completed. This work has been finished.

Federal project no. 5.—Remodeling the plumbing of the old sections. This entire amount has been expended, and as much of the work as could be completed within the sum authorized has been finished.

Federal project no. 6.—Replacing old steam pipes in tunnels. This entire amount has been expended, and the work completed within the limitation of the allotment.

Federal project no. 7.—Widening and enclosing porches of West Lodge 1. This resulted in replacing wooden floors with fireproof floors of concrete and brick, enlarging and furnishing day-rooms for patients. This work has been completed.

Federal project no. 8.—Furnishing cold storage and extension for general storeroom. This has been completed.

Federal project no. 9.—Widening roads and providing auto parking space. This work has been completed.

Federal project no. 10.—Additional water section including addition to Oaks–A building. This entire amount has been expended, and the work as far as could be done within the allotment completed.

Federal project no. 11.—Furnishing water sewers and drains for the new buildings known as continuous-treatment buildings and male receiving building. This work has been completed.

Federal project no. 12.—Repair and renovate greenhouses. This work has been finished.

Federal project no. 13.—Renovating laboratory. This entire amount has been expended, and the work done as far as could be under the allotment.

Federal project no. 14.—New floors throughout the west side service. This work has been completed.

Male receiving building.—The male receiving building, which has been under construction for the past 21 months, was completed and turned over to the hospital on June 29, 1934. This building has a

capacity of 400 beds. It is of monumental design, being 5 stories in height, with a beautiful entrance 2 stories in height, making a proper setting for the building. This is the building in which all white male patients will have their first reception, and efforts are made to give as good an impression upon their reception as possible. Quite a large number of these patients will probably be discharged from the hospital before being transferred to other buildings. This building contains all of the facilities for giving the various classes of treatment required for mental patients.

Disbursements.—The total amount of money disbursed by the hospital from the various appropriations and trust funds during the year was $3,350,000. The total collections, including reimbursements to the regular appropriations personal funds of patients and pension trust funds, were $2,160,000.

Supplies.—Orders were placed for supplies during the year amounting to $1,640,000. Of this amount, $1,183,000 was covered by formal contracts entered into by the hospital directly with contracting parties. These formal contracts entered into by the hospital included the female receiving building and furniture for equipping the male receiving building. There were 270 of these contracts.

Personnel.—The total number of employees on the hospital rolls June 30, 1934, was 1,549 of which 1,516 were permanent employees and 33 temporary employees, an increase in the permanent force of 102 employees and a decrease in the temporary employees of 60, or a net increase of 42.

During the year Congress passed an act reducing the percentage of deduction from wages of employees from 15 percent to 10 percent beginning February 1, 1934, and from 10 percent to 5 percent beginning July 1, 1934.

Limitations on the filling of vacancies were continued.

Legislation authorized the Public Works Administration, through which allotments were made to the hospital, resulted in the employing of more than 100 men for an average period of from 6 to 9 months.

The duties of clinical psychiatrist and director of laboratories were consolidated upon the acceptance of resignation of Dr. Walter Freeman, and Dr. Nolan D. C. Lewis was appointed as director of laboratories in charge of both activities.

During the year several of the old employees were retired from the service on account of age, including:

William H. Perkins	Foreman carpenter.
Samuel Keese	Plasterer.
Michael F. Drennan	Charge psychiatric nurse.
Robert F. Poston	Painter.
Edward Willer	Cabinet carpenter.
James S. Cook	Fireman.

The following were retired on account of disability:

Jesse J. Guin	Attendant.
Hattie L. King	Do.
Maude Butler	Do.
J. S. Edelen	Do.
Alice K. Walter	Do.
Edward D. McKinney	Do.
John T. Cook	Milkman.
Elvira Hanna	Waitress.
Norman A. Butler	Psychiatric nurse.
Gladys Speith	Do.
George W. Arendes	Assistant baker.
Samuel H. Todd	Assistant foreman of laborers.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year this department furnished occupation for 913 patients, slightly less than during the previous year. This work included weaving, sewing, toy making, woodwork, basketry, etc. In the industrial department there were made 24,960 sheets, 11,020 pillowcases, 26,532 towels, and 3,785 dresses. Many of the articles made by these patients were for the general use of the hospital. The approximate value of all supplies made was $31,305.

Red Cross.—The Red Cross continued to maintain a hospital unit during the past fiscal year. The psychiatric social workers attached to this unit are primarily concerned in case correspondence and contact work. During the past year that office sent out 3,023 letters and received 3,013 letters concerning patients and their affairs.

The psychiatric case-work staff has continued filing pensions and the referring of other types of claims to the proper authorities for action. During the past year Red Cross representatives participated in the handling of 375 claims.

Three thousand four hundred tickets of all classes were donated for the use of patients, about the same as during the previous year. These tickets covered baseball, football, athletic events of all sorts, moving pictures, etc. During the year there were 89 moving picture shows in Hitchcock Hall, on the hospital reservation. The athletic director has continued the work of organizing, supervising, and assisting the patients to participate in about 70 atheltic events.

Probably the most important single event of the year was what is known as the Red Cross Institute, which was assembled and conducted through the cooperation of St. Elizabeths Hospital and the American National Red Cross. This institute began on April 12 and continued through April 14, 1934. The delegates to this institute were experienced Red Cross workers, who had come from all over the United States to the National Convention of the American Red Cross,

which met in Washington. The Red Cross Institute for Home Service Workers opened at St. Elizabeths Hospital at the Red Cross house. The meeting was addressed by a number of hospital officials who briefly explained the various aspects of the hospital to them. The delegates were then separated into groups and taken on a tour of the hospital; they returned to the Red Cross house where they were given an opportunity to see an occupational therapy and industrial exhibit. In the evening the superintendent of the hospital gave an opening address, his subject being "The structure of the personality." He was followed by several other members of the staff who spoke on interesting subjects. Clinics were conducted from time to time by various members of the hospital staff and included a round-table discussion where various angles of the approach, contact, and care and treatment of mental patients were discussed.

MEDICAL DEPARTMENT

Library.—The library is divided into two parts, primarily that noted as the medical library, and that noted as the patients' library. The number of volumes in the combined library is approximately 30,800. Ninety books were added to the medical library by purchase and gifts, 600 books were added to the patients' library. The hospital subscribes to several newspapers and approximately 90 periodicals, magazines, etc. About 5,000 magazines, mainly surplus, were received from the Library of Congress and distributed to the various wards. Approximately 150 books are issued daily, and there are about 3,500 books in constant circulation.

Social-service department.—The work of this department during the past year included training of students from the hospital training school and from the social-service school.

The social service report from July 1, 1933, to June 30, 1934, showed the following:

Number of out-patients on rolls July 1, 1933	149
Number of out-patients on rolls June 30, 1934	93
Average number on rolls per month	131
Number of patients discharged from the rolls	65
Number of out-patients under care during the year	284
Interviews at the hospital pertaining to the work	569
Number of visits made in regard to this work	2,791

Training school.—Twenty-four students graduated in the nurse and psychiatric aide class during the year. The total number of students on the rolls July 1, 1933, was 63; there were also 21 affiliate students and 34 postgraduates. On June 30, 1934, there was approximately the same number. As of June 1, 1934, 20 preliminary students were admitted. These were selected from the top of a certified list of the

Civil Service Commission, consisting of 72 names of applicants who had passed out of a total of 1,100 candidates.

Medical and surgical wards.—The treatment of selected cases of pulmonary tuberculosis by the method of artificial pneumothorax, instituted during the previous year, was continued during the year just ended, with satisfactory results.

The number of patients treated with high voltage roentgen therapy during the year increased markedly over any previous year and in certain instances with excellent results so far.

The new cold quartz ultraviolet ray equipment purchased last year has proved to be of much value in many conditions where the old hot quartz type of equipment could not be used with advantage. Among these may be mentioned the treatment of endocervicitis at the gynecological clinic.

Owing to the fact that for a number of years we have been unable to produce successful inoculations with malaria, of either the tertian or quartan type, in many of our colored paretic patients, we undertook to treat these cases with the form of fever therapy produced by the injections of vaccine of typhoid fever, by the summation method. To date we have so treated about two dozen cases and the treatment is under way with additional ones. We have found no difficulty in producing fever reactions at will, to any degree within desirable limits, and the patients have always stood the rigors of the treatment admirably. The result so far as paresis is concerned is still a matter to be determined.

Dr. Charles L. Billard, for many years the attending physician for the eye, ear, nose, and throat clinic, resigned, and Dr. Skilling was appointed as attending ophthalmologist.

Male services.—The completion of the new male receiving building will result in several changes during the coming year. Continuous treatment building no. 1, which is at present being used as the male receiving building, will be in condition to receive other patients. At present it is contemplated that these patients will be moved in from P-building, permitting P-building to be used by the female department.

During the year efforts have been made to establish in each service a so-called "occupational index." A card is maintained for each patient showing the date of assignment to some particular work, the date when the work was stopped and the reason therefor, and the dates of any subsequent assignments and the types of work. Where possible the reason for changing a patient from one type of work to another has been briefly set forth, so that we have at all times a longitudinal section of the patient's occupational adjustment during his residence in the hospital. This index also enables the physicians at a glance to see the relative number of idle patients on each service. In

addition, there has also been established an index of the occupations followed by the patients before their admission to the hospital, which permits the physicians to assign patients to the type of work most closely allied to their previous occupations.

During the year the Indian patients, numbering 71, receiving treatment at Canton, S.Dak., were transferred to St. Elizabeths Hospital for treatment and the Canton Hospital closed. The male patients of this class were taken care of in a ward of continuous treatment building no. 2.

There was quite a decrease in the number of criminal patients confined in the Howard Hall department, due to the opening of the Department of Justice Hospital at Springfield, Mo., and the transfer of about 40 patients from St. Elizabeths Hospital to that institution.

There has been a general reclassification of patients, with an effort to put paroled patients from Richardson group on the west side, the working patients in the detached group service, and the more helpless patients, showing varying degrees of deterioration, in the semipublic building group.

Of course, the biggest problem to overcome in the hospital at the present time is the crowded condition. The patient population seems to be growing more rapidly than additional beds will be provided.

Female services.—In this department, as in the male services, the principal problems under discussion are plans for the distribution of patients on wards during the coming year. The buildings are crowded and additional beds are needed. With the limited appropriations it is difficult to get adequate personnel. This seems to be the day of change in the order of things, and one of the problems of the staff is to maintain the high standard of treatment for patients with the provisions that are at hand. When P-building is released to women this will help in some way to solve the difficulty, and then when the female receiving building has been completed this will go a long way toward giving the additional beds required.

Psychotherapy.—A monthly average of 18 selected patients were afforded psychotherapy.

With a few exceptions all admission diagnostic conferences have been conducted by the clinical psychiatrist.

Two hundred lectures and clinics have been given by the doctor in charge and assistants for the local medical schools, schools of nursing, and naval medical officers.

Work on the comparative psychiatry of the Negro and Indian has been conducted through the year.

An extensive research into the nature and causes of suicide has been carried on during the year, including ethnologic, psychiatric, and psychoanalytic methods of approach.

A comprehensive research problem in dementia precox has been in process of organization during the year.

Laboratory.—The work of the laboratory has increased in nearly all respects. Dr. Lewis, the new director of laboratories, has continued all the work previously started and efforts are made to branch out into new assignments.

NEEDS OF THE HOSPITAL

An estimate of $1,218,780 for the support, clothing, and treatment of the patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1936, was recommended. This amount was based on 1,850 patients. The hospital at the present time has 5,200 patients. The average for the fiscal year 1934 was 5,049, as compared with 5,036 the previous year, an increase of 13. The average for the fiscal year 1936, it is estimated, will be 5,510, 310 more than the present number. The 5,510 are divided as follows: 1,850 Federal patients, appropriated under the title of St. Elizabeths Hospital in the Interior Appropriation Act; District of Columbia patients, 3,300, beneficiaries of the District of Columbia, and appropriated for in the District of Columbia Appropriation Act; United States Veterans' Administration beneficiaries, 120, and carried in the appropriation of the United States Veterans' Administration; United States Public Health Service beneficiaries, 130, and provided for in the appropriation for the Treasury Department, under Public Health Service; United States Soldiers Home beneficiaries, 35, and payment for these to be received from that service; Indians, 75, received from the Indian reservations, who will be chargeable to the Bureau of Indian Affairs (conservation of health among Indians).

The rate estimated for the care of patients during 1936 is $1.80 per capita per day. This includes the basic salary without the 5-percent deduction at present in effect. At the present time the rates of food supplies, forage, textiles, etc., seem to be on the upgrade. The effect of the N.R.A. action in providing codes for all industries seems to have a tendency to increase the cost of various items, and any increase must be included in the appropriation.

Included in the estimate is $200,000 that is essential to keep up the repairs and necessary improvements to buildings and grounds. This is the same amount as authorized for 1933 and 1934. For the year 1935 this amount was reduced to $175,000, due to the fact that funds were allocated to the hospital from the Public Works Administration for reconditioning purposes. Out of these repairs will come funds for keeping approximately 100 buildings in repair, repairing and widening roads and walks, the maintenance of railroad tracks, replacing glass, painting, etc.

The hospital has been growing so rapidly that it is still at a loss to provide the necessary beds, notwithstanding the additional buildings erected. There has just been completed the male receiving building, for 400 beds, and there is now under construction a female receiving building, for 300 beds. The hospital at the present time is overcrowded to the extent of about 900 beds. The increase each year is about 200 beds, so during the course of the next 2 years there will be a shortage of from 500 to 600 beds. Included in our estimates is an item for 4 continuous-treatment buildings at the rate of $200,000 each, or a total of $800,000. This will provide approximately 600 beds, and unless there is an unusual increase will permit us to provide a bed for each patient without overcrowding. This form of building would permit the construction at the rate of $1,333 per bed, which is very low for a fireproof building. We believe we can erect these buildings and equip them with all necessary incidental expenses within the amount estimated.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS TO ST. ELIZABETHS HOSPITAL

We again recommend that a bill be introduced in the House of Representatives and in the Senate of the United States to change the method of admissions to St. Elizabeths Hospital. We believe that the best manner to have this bill introduced would be through the District Commissioners, the hospital cooperating in the drawing up and the presentation of the proposed bill. With this point in view the hospital has had several conferences with the Board of Public Welfare of the District, at which were present representatives of the corporation counsel's office, and the information furnished on the basis of additional legislation desired.

STAFF CHANGES JULY 1, 1933, TO JUNE 30, 1934

The following appointments were made during the year:

Junior medical officers (internes): Judah Marmor, Meyer Beber, Sidney Berman, Helen Yarnell, Alexander Wolf.

Visiting ophthalmologist: Francis C. Skilling.

The following resignations took effect during the year:

Junior medical officers (internes): E. Gaine Cannon, Myron M. Campbell, Frederick T. Zimmerman, Edward S. Post, Raoul L. Ramos, William L. Blair.

Assistant medical officers: Elsie Blanchard, J. Lester Henderson.

Director of laboratories: Walter Freeman.

Visiting ophthalmologist: Charles L. Billard.

PUBLICATIONS

White, William A., superintendent:

Some suggestions for the future. (Address at the eighty-ninth annual meeting of the American Psychiatric Association, Boston, Mass., May 29–June 2, 1933.) The American Journal of Psychiatry, vol. XIII, no. 2, September 1933, pp. 227–234.

Enlarging responsibilities for the physician. The Journal of Nervous and Mental Disease, vol. 79, no. 5, May 1934, pp. 497–504.

How three experts evaluate the Fairfield Plan—A comment on the plan of Connecticut's New Mental Hospital. The Modern Hospital, vol. XLII, no. 5, May 1934, p. 50.

O'Malley, Mary, clinical director:

Presidential Address, Quarterly Bulletin of the Medical Women's National Association, no. 41, July 1933, pp. 14–18.

Hall, Roscoe W., clinical director:

The Organization of Psychotherapy. American Journal of Psychiatry, vol. XIII, no. 3, November 1933, pp. 671–677.

(With Freeman, W. and Eldridge, Watson W.) Malaria Treatment of Dementia Paralytica. The Southern Medical Journal, vol. XXVII, no. 2, February 1934, pp. 122–126.

Eldridge, Watson W., internist and roentgenologist:

(With Hall, Roscoe W., and Freeman W.) Malaria Treatment of Dementia Paralytica. The Southern Medical Journal, vol. XXVII, no. 2, February 1934, pp. 122–126.

Lewis, Nolan D. C., director of laboratories:

Neuropsychiatric Aspects of Female Endocrinology. Medical Annals of the District of Columbia, vol. III, no. 4, April 1934, pp. 89–94.

Studies on Suicide, I., Psychoanalytic Review, vol. XX, no. 3, July 1933, pp. 241–273.

Studies on Suicide II., Psychoanalytic Review, vol. XXI, no. 2, 1934, pp. 146–153.

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HOWARD UNIVERSITY

(Mordecai W. Johnson, President)

The year 1933–34 was the third of the 10 years involved in the program of development approved by the Government. The university continued to suffer from the depression though to a much slighter degree than during the previous year. Summer school, theological college, and correspondence courses, enrolling 394 students last year, were discontinued, but the total enrollment fell only 267 below the previous year. The university suffered further loss of income for current educational expenses from the Federal Government and from private sources, and there were further heavy curtailments of expenditures for materials and supplies and for educational and scientific equipment. The teaching staff was further reduced by 35 members. Teachers' salaries remained far below the average agreed upon by the Government and needed advances in rank were delayed for the third successive year. In order to meet the distressing needs of students the trustees devoted 7½ percent of all student fees to a special scholarship fund, reduced room and board, and established an installment plan of fee payments. The total budget, however, was kept at balance with a surplus of income over expenditures and the percentage relation between total Government funds and private funds was maintained with a variation of only 0.78 percent from the relation planned for the year 1933–34 in the 10-year program.

The university continued to receive help from the General Education Board, the Rockefeller Foundation, and Julius Rosenwald Fund for the development of the libraries, the further improvement of the teaching staff through fellowships, and for the extension of the university grounds. The program of land extension, financed by gifts from the General Education Board and the Julius Rosenwald Fund, drew to its close. The total land acquired, with improvements thereon, was valued at $1,089,398.

The teaching staff continued to take encouraging advantage of sabbatical leave, scholarship, and fellowship privileges for self-improvement, more than one-ninth of the full-time staff being away for further study. Limited funds, however, did not permit substantial improvement in the maturity of the teaching staff, so that the number in the professorial rank still remained but little beyond half the number required for adequacy. Teachers were heartened by the

return of 5 percent of the prevailing 15 percent salary cut and by the trustee adoption of an improved retirement plan.

In spite of limited funds for research equipment and assistance, the teachers continued productive of scholarly activity, publishing or having accepted for publication 62 scholarly articles and 6 books. Publication of the Journal of Negro Education was also continued.

Through the use of specially appropriated Public Works and Civil Works funds the buildings and grounds of the university were extensively improved. The contract was let and work was well under way on a new classroom building, and the contract was let for a new chemistry building. Plans for a new heat, light, and power plant were practically ready for bids, and the plans and specifications for the new library were to be completed in August.

The semester system, on the whole, worked satisfactorily during its first year. The colleges of education and applied science closed their last year's work as separate colleges. Beginning July 1 the work in education passes into a department of the college of liberal arts, and the departments of art and home economics are transferred also from the college of applied science to the college of liberal arts. The work in civil, electrical, and mechanical engineering will thenceforth be done under the auspices of the school of engineering and architecture established by trustee action on January 8, 1934. Further trustee legislation formally organized the graduate school beginning July 1, 1934, and appointed a full-time graduate dean. The graduate school of religion went through its first year's work with a budget far below its needs. The venerable dean of the school retired and his successor was elected.

Throughout the university there was manifest increase of interest in artistic courses and activities, including music, the drama, and the plastic arts.

The first step was taken toward the introduction of a formal course for the training of dental hygienists, and the college of dentistry experienced a substantial increase in the new student enrollment (15) for the first time since the establishment of the new plan of instruction. The school of law, hitherto a probationary member of the American Association of Law Schools, was elected to full membership in that body, following a thorough official survey.

The need for advancing the maturity of the staff by a substantial increase in the number of competent teachers in the professorial rank is still primary and urgent. Increased scholarship funds are also imperative. The new library seems now assured, but there is great need for more books in every division of the university's work. Clark Hall, our present men's dormitory, and the old medical building, now used for dentistry, should be replaced as soon as possible, and the school of law ought to be moved to a point in proximity to the under-

graduate and graduate student activities, in a building with much greater floor space.

The registrar's unfinished collection of available addresses of the living Howard graduates shows 6,190 of them at work in 43 States and 24 foreign countries.

REGISTRATION

1. *Enrollment for the year 1933–34.*—At the opening of the school year 1933–34, Howard University operated on the semester system. The following table (table 1) shows the net total enrollment during the year, including the first and second semesters, and excluding duplicates, as compared with the summer, autumn, winter, and spring quarters of 1932–33.

Summary of students enrolled in Howard University for the years 1933–34 and 1932–33

Divisions of the university	Net enrollments							
	1933-34			1932-33			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts	541	381	160	540	375	165	1	
College of education	379	83	296	523	113	410		144
College of applied science	67	36	31	77	50	27		10
School of music	49	21	28	41	16	25	8	
Graduate division	164	66	98	170	83	87		6
Total	1,200	587	613	1,351	637	714	9	160
Professional schools:								
Theological college	21	20	1	40	32	8		19
Graduate school of theology	11	11	0	10	10	0	1	
Law school	37	37	0	44	44	0		7
School of medicine:								
College of medicine	203	196	7	206	200	6		3
College of dentistry	39	38	1	38	37	1	1	
College of pharmacy	22	19	3	24	22	2		2
Total in professional schools	333	321	12	362	345	17	2	31
Total in regular courses	1,533	908	625	1,713	982	731	11	191
Special students in music, law, dentistry	93	31	62	96	30	66		3
Correspondence students (religion)	0	0	0	84	82	2		84
Total special students	93	31	62	180	112	68		87
Grand total (net)	1,626	939	687	1,893	1,094	799	11	278

This table shows that the total enrollment for the year 1933–34 was 1,626, of whom 939 were men and 687 were women, as compared with the total of 1,893 for 1932–33, of whom 1,094 were men and 799 were women. A net loss of 267 students, or 14 percent, is indicated, as compared with the net loss of 571, or approximately 23 percent, for the preceding year. This loss was mainly due to the discontinuance of the summer school and the theological college and correspondence courses, which together registered 394 students in 1932–33.

There was a loss of only 39 in the group of entering students. In this loss the to-be-discontinued college of education led with 32. Liberal arts, music, dentistry, and pharmacy registered gains in the new student group of 9, 3, 15, and 4, respectively. In the net loss of 39 students 32 were women. Only 3 new women students registered in the professional schools and colleges.

2. *Geographical distribution.*—Thirty-eight States sent 1,423 candidates for degrees in 1933–34 as compared with 40 States sending 1,590 candidates in 1932–33. Fourteen of these States sent increased enrollment of from 1 to 9 students. Four States sent 10 or more candidates for degrees. The percentage of students coming from the District of Columbia was 30.1 percent as compared with 31.3 percent for 1932–33.

Fourteen foreign countries sent 110 candidates for degrees during the school year 1933–34, as compared with 17 foreign countries, with a total of 123 candidates for degrees in 1932–33. The largest group of foreign students (79) came from the British West Indies. Four came from the Virgin Islands, two of whom were receiving liberal scholarships from Howard University.

3. *The scholarship of entering students.*—During the year the registrar of the university made a careful study of the records of 1,082 new students entering the undergraduate colleges during the 5-year period, 1928–33. He found that 282, or 26 percent, made records of B (above average) and above; 486, or approximately 45 percent, made the record of C or C plus (average records); while 314, or 29 percent, made records below C (below average). Of this last group 159, or 15 percent of the entire group, made records which caused them to be dropped for poor scholarship, while 155, or 14 percent of the entire group, were able to continue their work at the university.

4. *Widening support of the secondary schools.*—During the school year 1932–33, 123 secondary schools sent 334 new students to Howard University. During the school year 1933–34 the 306 new students came from 147 secondary schools—an increase of 24 schools, or 19.6 percent.

5. *Growth in students of advanced standing.*—During the school year 1933–34, 54 students entered the undergraduate colleges with advanced standing from 33 institutions, as compared with 22 such students from 14 institutions in 1932–33.

Fifty-three out of 92, or approximately 58 percent of the new students entering the professional schools last year, were equipped with 4 years or more of previous college training. Of the 1,626 students in the entire institution 360, or 22.1 percent, were persons holding one or more academic degrees.

6. *Scholarships and student aid.*—At the beginning of the school year the trustees of the university set aside 7½ percent of all student fees

as a special scholarship fund for needy students. They also made special provision for increased work opportunities for students, reduced the price of room and board, and provided an installment system of fee payments. These plans were strengthened in the second semester by the special aid extended to students throughout the Nation by the Federal Emergency Relief Administration. By these combined measures 247 students were helped in the undergraduate colleges, and approximately 17½ percent of the professional students were also given aid during one or more semesters.

All scholarships and student aid were awarded to needy students in the order of excellence in scholastic standing. Support was thereby given to all other measures stimulating earnest scholarly work. These student-aid measures were far from adequate, however. Many worthy students, desiring to enter, could not be helped at all. Many who came were able to remain for one semester only, while others were able to take only a half or a third of a normal student load. Some clung to their ambition against apparently insuperable difficulties. A wider extension of scholarship aid is imperative.

GRADUATES

In 1933–34 a total of 231 students were graduated. This number represents a decrease of 88 from the group of graduates in 1932-33, indexing the effect of the depression in the 4 previous years. The reduced graduation numbers were shared by all divisions of the university with the exception of the colleges of applied science and medicine, which shared gains of 2 and 5, respectively. The following table shows the distribution of the graduates by divisions and by sex.

Summary of students graduated by Howard University for the years 1933–34 and 1932–33

Divisions of the university	Graduates						Total gain	Total loss
	1933–34			1932–33				
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts	51	28	23	64	44	20	----	13
College of education	71	11	60	122	26	96	----	51
College of applied science	9	8	1	7	3	4	2	----
School of music	2	0	2	4	1	3	----	2
Graduate division	29	14	15	34	16	18	----	5
Total	162	61	101	231	90	141	2	71
Professional schools:								
Theological college	6	6	----	7	3	4	----	1
Graduate school of theology	1	1	----	3	3	----	----	2
Law school	7	7	----	8	8	----	----	1
School of medicine:								
College of medicine	47	46	1	42	42	----	5	----
College of dentistry	6	6	----	18	17	1	----	12
College of pharmacy	2	2	----	10	9	1	----	8
Total in professional schools	69	68	1	88	82	6	5	24
Grand total	231	129	102	319	172	147	7	95

Of the 29 students who received degrees from the graduate division, 19 were awarded the degree of master of arts, while 10 received the degree of master of science. Of the 51 graduates in liberal arts, 26 received the degree of bachelor of arts, 20 the degree of bachelor of science, and 5 the degree of bachelor of science in commerce. Of the 71 graduates in the college of education, 57 received the degree of bachelor of science in education. Of the 9 graduates in applied science, 3 received the degree of bachelor of science in civil engineering, 3 the degree of bachelor of science in electrical engineering, 1 the degree of bachelor of science in home economics, and 2 the degree of bachelor of science in mechanical engineering. One graduate received the degree of bachelor of music and 1 the degree of bachelor of school music.

In the professional schools 47 graduates received the degree of doctor of medicine, 6 the degree of doctor of dental surgery, and 2 the degree of doctor of pharmaceutical chemistry. In the school of law 7 degrees of bachelor of laws were conferred, while the school of religion awarded to 1 the bachelor of divinity degree and to 6 the bachelor of theology degree.

Honorary degrees.—No honorary degrees were conferred at commencement in June 1934.

Distribution of living graduates.—During the last 3 years the registrar of the university has been endeavoring to secure addresses of all living graduates of Howard University. Thus far he has succeeded in getting 6,191 out of a total of 8,941. Of this group 6,059 are found to be at work in 42 States and the District of Columbia, and 132 at work in 24 foreign countries. It is estimated that approximately 1,000 graduates are deceased while 1,650 addresses of the living remain to be secured.

TEACHING STAFF

1. *Number of teachers.*—There were 237 members of the teaching staff during the year 1933–34, of whom 135 were on full time and 102 were on part time, representing together a full-time equivalent of approximately 154 teachers, as compared with a total of 265 members of the teaching staff during the year 1932–33, of whom 153 were on full time and 122 were on part time, representing together a full-time equivalent of 174½ teachers. This represents a reduction of 38 in the faculty of 1933–34, as compared with the faculty of 1932–33, 18 of whom were full-time teachers.

2. *Improvement of staff.*—The teachers continued their work of self-improvement through further study. Twelve of them were on leave of absence or under fellowship privileges with contract to accept appointment at Howard University. Of the 12 away, 6 were from the college of liberal arts, 1 from education, 2 from music, and 3 from medicine.

During the period of 5 years expiring 1933–34, the university has enjoyed two special grants for the further training of teachers, 1 from the Rockefeller Foundation for the further training of teachers in medicine and 1 from the General Education Board for the further training of teachers in the natural sciences. The use of the Rockefeller Foundation grant has enabled the university to reconstruct the entire work of the preclinical branches of medicine through the training and employment of men of superior ability in every department. The General Education Board grant has been of invaluable assistance in building up the departments of chemistry, zoology, mathematics, and physics. These special grants have been accompanied by annual grants from the Julius Rosenwald Fund and the General Education Board which, supplementing the university sabbatical-leave privilege, have made possible increased educational opportunity for teachers in the majority of the departments of liberal arts, education, and music.

3. *Maturity of the staff.*—Of the 154 full-time and full-time-equivalent teachers on the staff of Howard University during the current year 35, or 22.7 percent, were professors; 25, or 16.2 percent, were associate professors; 32, or 20.8 percent, were assistant professors, while 62, or 40.3 percent, were in the rank of instructors and below. On the basis of the 10-year program of development which calls for a percentage distribution in the four leading ranks of 40, 10, 20, and 30 percent, the present staff (full-time and full-time-equivalent) should have a distribution as follows: 62 professors, 15 associate professors, 31 assistant professors, and 46 instructors. The university has yet about half-way to go in the development of a staff of mature professors. Examination of university salaries confirms this judgment. The university is spending approximately $175,000 less in salaries than would be necessary to obtain and hold the services of a sufficient number of mature professors. The securing of 27 capable scholars for important positions on the professorial staff of the university is the outstanding educational need. All other improvements are subsidiary to and wait upon this for their fullest effectiveness.

4. *Salaries of teachers.*—The salaries of teachers at Howard University remained as at last year, with the exception that 5 percent of the prevailing 15-percent cut was restored during the second semester. In setting up the 10-year program of development for Howard University the Government agreed upon a definite salary scale for teachers. The salary cuts struck the teachers before even the minimum salaries in this scale could be uniformly established. The result is that during the year 1933–34, 78 of the 135 full-time members of the teaching staff were receiving actual salaries below the minimum for their rank agreed upon by the Government in the 10-year program, 49 others received salaries slightly above minimum but below the average, while only 8, or less than 6 percent, received a salary at or above the agreed-upon average.

Under these circumstances it appears imperative that the full amount of the prevailing salary cut shall be restored at the earliest possible moment and that additional funds be secured to enable Howard University to improve the salary offerings to its teachers.

5. *Retirement legislation.*—On April 10, 1934, the trustees of the university adopted new retirement legislation, effective July 1, 1934, replacing temporary arrangements in effect since June 7, 1927. The new legislation sets the compulsory retirement age at 65 and provides that an officer or teacher in the service of the university for 20 years at the time of retirement may receive deferred annuities reaching as high as one-half of the annual salary on condition that the officer or teacher pay monthly premiums of 5 percent of current salary to be supplemented by a further 5 percent paid by the university to the Teachers Insurance & Annuity Association of America. Special provisions are made whereby officers and teachers now over 45 may be guaranteed an annuity on retirement equal to one-third the basic salary for 1933–34, whereby officers and teachers not in the service for 20 years may receive certain annuities with the help of the university, and whereby employees of the university other than officers and teachers may, upon application, secure the cooperation of the university to the extent of 5 percent of the annual salary toward a deferred-annuity allowance.

GRADUATE DIVISION

1. *Student enrollment.*—During the year 1933–34 there were 164 graduates in residence in Howard University, including 66 men and 98 women, 106 of whom were registered as pursuing graduate degrees in 18 departments of the graduate division.

2. *Degrees awarded.*—The number of students who received advanced degrees in 1933–34 was 29 as compared with 34 in 1932–33, 18 in 1931–32, and 13 in the year 1929–30—the highest preceding peak years. Of the 29 degrees awarded, 19 were masters of arts, awarded to 7 men and 12 women; and 10 were masters of science, awarded to 7 men and 3 women. Five of the degrees were awarded in chemistry, 3 in education, 6 in English, 1 in French, 2 in German, 6 in history, 1 in mathematics, 2 in physics, 1 in political science, and 2 in psychology.

3. *Teaching staff.*—The teaching staff of the graduate division during the school year 1933–34 included 47 members as compared with 48 members in the year 1932–33. Of this number 17 were professors, 13 associate professors, 13 assistant professors, and 4 instructors. Thirty-six of the teachers were from the faculty of the college of liberal arts, 7 from the faculty of education, and 2 from the faculty of the school of religion.

4. *Research and publication.*—The head of the department of zoology is continuing his research in the Marine Biological Laboratory

in Naples, Italy, under sabbatical leave. Other research was continued but severely restricted on account of lack of funds. Teachers and officers published and had accepted for publication 6 books and 62 scholarly articles.

5. *The future of graduate work.*—The year 1933–34 brought to an end the 7-year experiment with a graduate division of the university, under the control of a committee of instruction appointed by the president of the university from among the several faculties. Beginning with the school year 1934–35, graduate instruction will be carried forward in a separate graduate school presided over by a dean already appointed.

The formal organization of the graduate school on the basis of assured need emphasizes the necessity of the earliest possible advancement of all those phases of university life which may assure the competence of this work: (1) The securing of an increased number of mature scholars in the professorial rank, with salaries enabling them to devote their full time to their work; (2) the development of a substantial number of graduate scholarships and fellowships for the encouragement of advanced students; (3) the rapid advancement of book collections in every department offering graduate work.

COLLEGE OF LIBERAL ARTS

1. *General trends.*—During the year 1933–34 the college of liberal arts sustained its enrollment and registered a gain of 1, but the number of degrees awarded showed a drop of 9, giving index to the depression losses in former years. Progress was made toward group organization of the faculties and the mortality in freshman English classes was greatly reduced through the sectioning of freshman English classes on the basis of ability determined by preliminary tests. A faculty committee on the improvement of instruction engaged in the preparation of legislation looking toward this end. The construction of the new chemistry and classroom buildings offered early prospect of great improvement in equipment.

At the beginning of 1934–35 this college will absorb the entire work of the college of education in a department of education, and it will also take over the work of the departments of art and home economics hitherto organized in the college of applied science. It is expected that this change will double the number of students registered in the college of liberal arts, increasing the administrative responsibility to that extent. The size of classes and teaching loads of individual instructors in liberal arts, however, will not be much changed.

2. *Students.*—The college of liberal arts enrolled 541 students during the year 1933–34, 381 of whom were men and 160 were women. This represents an increase of 1 over the enrollment of 1932–33.

Students in this college were greatly helped by the special scholarship and student-aid plans of the trustees and by the supplementary student aid coming from the Federal Emergency Relief Administration in the second semester.

3. *Graduates.*—The college of liberal arts awarded 51 degrees in the year 1933–34, a net loss of 9 in comparison with the preceding year. Of these 51 graduates, 26 received the degree of bachelor of arts, 20 the degree of bachelor of science, and 5 the degree of bachelor of science in commerce.

4. *Teaching staff.*—There were 69 members of the faculty of the college of liberal arts during the academic year 1933–34, 63 of whom were full-time teachers and 6 part-time, representing together a full-time equivalent of 64⅘ teachers. This marks a loss of 14 teachers, 13 of whom were full-time and 1 part-time. The 69 teachers for the year were distributed as follows: Professors, 19 (17 full-time and 2 part-time); associate professors, 12; assistant professors, 15 (14 full-time and 1 part-time); instructors, 18 (16 full-time and 2 part-time); assistants, 5 (4 full-time and 1 part-time). During the academic year 7 teachers returned from leave of absence for further study, while 5 were away for the same purpose. There were three appointments during the year. Two teachers retired for age, and two members of the staff were taken by death.

Members of this faculty published 27 articles and 1 book during the year. It is to be hoped that an early return of normal conditions will permit the reappointment of native teachers in German and Spanish and the addition of one member each to the departments of political science, romance languages, sociology, and physical education for women.

5. *Special grants from General Education Board.*—The year 1933–34 was the fifth and last year of the privileged use of two special 5-year grants from the General Education Board—one for $29,000 for the further training of teachers in the natural sciences and another of $28,000 for the further development of libraries of the natural sciences. Twelve thousand dollars of the grant for the libraries was used in 1929–30 and $4,000 in each of the 4 succeeding years, for the purchase of greatly needed books in chemistry, physics, zoology, botany, and mathematics. This grant enabled the establishment and initial development of departmental libraries in each case and greatly strengthened the work. Of the grant for the further training of teachers in the natural sciences the University was able to use $21,250 during the 5-year period in aid of more than 13 years of further study for 9 teachers in chemistry, zoology, physics, and mathematics.

COLLEGE OF EDUCATION

1. *The discontinuation of the college of education.*—The college of education ceases its existence as one of the units of the University on June 30, 1934, as the result of the action of the board of trustees taken at its April meeting 1933. Thenceforth the work of education will be done by the same faculty group in a department of education in the college of liberal arts.

2. *Enrollment.*—The enrollment of the college of education in 1933–34 was 379, representing a drop of approximately 27.5 percent from the enrollment of 523 in 1932–33. The discontinuance of the summer school, largely recruited from teachers, and the announced integration of the work in education with the college of liberal arts, as well as the depression conditions referred to in the last report, contributed to this loss.

3. *Practice teaching.*—During the year 58 student-teachers worked at practice teaching in 10 public schools of the District of Columbia, and taught 14 subjects as their majors in fulfillment of requirements for graduation. We are grateful to record that this privilege has been extended to our students for the past 14 years.

4. *Graduates.*—In 1933–34 there were 71 graduates of the college of education. Fifty-seven degrees of bachelor of arts and 14 degrees of bachelor of science in education were awarded. Of the 29 graduate degrees awarded during the year 3 were in the field of education.

5. *Faculty.*—The teaching of courses in education was done by 9 full-time teachers, including the dean, and 5 part-time teachers whose major assignments were in other departments. The 2 teachers on leave last year resumed their duties and 2 received the degree of doctor of philosophy from Columbia University during the year. The 9 members of the group published, during 1933–34, 2 books, 8 magazine articles, and 6 book reviews, and completed the second volume of the journal of Negro education which closed with a notable year-book number of 564 pages on "The Physical and Mental Abilities of the American Negro." The number contains 18 pages of carefully selected bibliographical material on this subject which is stated by the editor to "constitute the most comprehensive and up-to-date single source on this topic that can be found in print at this time."

COLLEGE OF APPLIED SCIENCE

1. *Organization and curricula.*—During the school year 1933–34 the college of applied science offered six curricula in four major departments, as follows: Architecture, art, home economics, and engineering—including civil engineering, electrical engineering, and mechanical engineering. The board of trustees voted to discontinue the college of applied science at the end of 1933–34 and in its stead to estab-

lish the school of engineering and architecture, a separately organized and administered higher educational unit, with a dean at its head. The present acting dean of the college of applied science has been appointed acting dean of this new school. The departments of art and home economics are to be merged with the college of liberal arts. Until such time as graduate instruction may be offered by the school of engineering and architecture, the school will follow the policy of directing certain of its graduates to other institutions for advanced work. No new departments will be added to the school at the present time.

2. *Enrollment.*—During the year 153 individual students pursued courses in this college as compared with 177 during the previous year. Sixty-five of these students enrolled for degrees offered by the college of applied science, equaling in number the 65 students of the school year 1932–33.

3. *Scholarships.*—Eleven scholarships, including six Federal Emergency Relief Administration work scholarships, were made available to students of the college of applied science during the school year. This represents an increase of eight scholarships over the number available during the preceding school year.

4. *Graduates.*—The college of applied science awarded 9 degrees in the year 1933–34, as compared with 8 degrees during 1932–33. The 9 degrees awarded were as follows: Bachelor of science in civil engineering, 3; bachelor of science in electrical engineering, 3; bachelor of science in mechanical engineering, 2; bachelor of science in home economics, 1.

5. *Teaching staff.*—In 1933–34 there were 15 full-time and 1 part-time teachers. One faculty member returned from leave of absence and one earned the degree of doctor of philosophy during the year. One instructor was granted sabbatical leave for the school year 1934–35. A member of the faculty was appointed architect to the Division of Subsistence Homesteads. Three members of art department staff contributed their works to current exhibitions of art, including the annual water color exhibition at the Philadelphia Academy of Fine Arts, the Negro artists' exhibition sponsored by the College Art Association and the Harmon Foundation, and the Negro artists' exhibition at the National Galleries, Washington, D.C., sponsored by the Association for the Study of Negro Life and History.

6. *Contributions to the community in adult education.*—Through the activities of the departments of this college there were several contributions to current community life, especially along the line of adult education. The university's service was extended to civic groups and associations on such topics as consumers' education, art appreciation, clothing economics, and special informal short course

lectures on building construction. This work was closely related to the general program of the college which included exhibitions of works of art, exhibitions of fitness, beauty and economy in dress, architectural exhibitions, and the engineering laboratories' "open house."

The art department provided 10 exhibitions of art, including 2 on African art, and 8 lectures including 1 on the Bushmen Painters and 1 on Negro art. The art exhibits were attended by 9,581 persons. By loan from the Government to Howard University the department of art acquired the possession and use of 11 works painted by Negro artists in connection with the Public Works art project.

SCHOOL OF MUSIC

1. *Enrollment.*—The enrollment of the school of music again showed an increase in 1933–34, in a general trend of increased music enrollment over a period of 5 years, beginning with 78 students in 1929–30. There was an average enrollment of 140 during the current year, with 28 new matriculants in the first semester and 12 in the second.

2. *Beneficial scholarships.*—Eighteen students in the school received scholarship aid during the year from four sources: Seven special university scholarships of $150; gift scholarships from the school of music faculty and the musical arts society, $186.85; and work scholarships through the university and the Federal Emergency Relief Administration. These scholarships were very helpful to the registration, scholarship, and morale of the school.

3. *Courses and faculty.*—Courses were offered in piano by 3 teachers; in organ by 1 teacher; in voice by 2 teachers; in violin, orchestration, string and percussion instruments by 1 teacher; in public-school methods by 1 teacher; in theory and appreciation of music by 2 teachers; and in the junior piano department by 3 teachers. The total faculty of 9 included 2 professors, 1 assistant professor, 5 instructors, and 1 assistant. Two members of the faculty were away on sabbatical leave for further study. Representative recitals were given during the year by four members of the faculty in four States and the District of Columbia. Monthly recitals were given in the recital hall by all advanced students of the school of music, including this year the departments of voice, violin, and piano, with representation from the junior piano classes. At the end of the year the work of the school found expression in formal recitals in the university chapel.

4. *Musical organizations.*—Students of the school of music found avenues of expression and service through four musical organizations: The University choir, the University glee club for men, the women's glee club, and the musical arts society.

5. *University concert series.*—During the year the Howard University concert series, maintained to feed and develop the cultural appreciation of music, was continued under the auspices of the school of music. One singer, two pianists, one violinist, one glee club, and the National Symphony Orchestra of Washington were presented with such a cordial response from students, faculty, and citizens that all bills were paid with a substantial cash balance remaining toward the budget of the coming year. The warm appreciation of this musical series, considered in relation to the wide-spread interest in the art exhibits and in the student dramatic presentations in the department of English in the college of liberal arts, indicates an encouraging growth of interest in the arts throughout the University.

6. *Graduates.*—Two degrees were conferred at commencement: The bachelor of music degree to one student with a major in organ, and the bachelor of school music degree to one student specializing in public-school music.

7. *Organ.*—The trustees have placed the school of music in position to acquire an organ. This instrument will complete the range of equipment for the school and will enrich its work in many ways. The faculty rejoices.

MILITARY SCIENCE AND TACTICS

1. *Headquarters' appraisal of the work.*—Under date of June 11, 1934, the acting chief of staff, Headquarters Third Corps Area of the United States Army, transmitted a letter expressing the gratification of the headquarters over "the excellent results attained by the unit, as shown by the report of inspection recently completed at your institution", and quoted from the report of inspection signed by command of Brigadier General Tracy:

> All indications point to a better unit at Howard University. Tremendous strides toward improvement have been accomplished during the past year.
>
> There is marked improvement in the efficiency of this unit which, in my opinion, deserves special mention in this report.
>
> General rating of the unit: Excellent.

2. *Enrollment.*—The enrollment in military science and tactics during the year 1933–34 was 266 during the first semester, and 246 during the second semester, with an average for the year of 256.

3. *Commissions awarded.*—Twenty students were awarded commissions as second lieutenants of infantry, in the Reserve Officers' Training Corps of the United States Army.

4. *Teaching staff.*—The teaching staff of military science and tactics includes 5 members as follows: Professors, 1; assistant professors, 1; assistants, 3.

SUMMER SCHOOL

There was no summer school during the year 1933–34, in accordance with the legislation of the board of trustees providing that beginning with the school year 1933–34 the summer school shall be discontinued. Enrollment of the last session of this school during 1932–33 was 291.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the University without superseding the direct lines of authority from the independent faculties of its member units to the board of trustees. Freedmen's Hospital, an independent institution built upon grounds owned by the University, is functionally a part of the University medical unit.

THE COLLEGE OF MEDICINE

1. *General trends.*—The main objectives for the year have been: (1) To hold the ground already gained educationally in face of serious budget reductions; (2) to improve cooperation among the departments of instruction in the school and between the school and the Freedmen's Hospital; and (3) to keep students from becoming discouraged and withdrawing from school on account of lack of funds. During the year surveys of the school were made by the State boards of Massachusetts and Pennsylvania. A survey by the State of Illinois is now in progress. The council on medical education has announced its plan to make another survey of all the medical schools in the United States. In this forthcoming survey emphasis will be placed on the quality of teaching personnel, the adequacy of scientific equipment, apparatus, and supplies, and upon the availability of a teaching hospital under proper educational control.

2. *Students.*—Of a total of 201 applicants for admission, 137 satisfied the minimum requirements. Forty-eight new students were admitted to the freshman class. One hundred and ninety-nine students were registered in the first trimester, 198 for the second, and 195 for the third. Twenty-four of those admitted held the bachelor's degree, 1 the master's degree, while all the others presented credit for at least 3 years of approved college work. Eight students withdrew during the year but only 3 of these on account of lack of funds. In no case, however, has a medical student with demonstrated ability and of scholastic advancement well above the average been compelled to withdraw on account of lack of funds. The small-payment plan adopted by the University prevented many students from withdrawing on account of inability to pay their way. The scholarship-aid plan instituted last year has amply justified itself. In accordance with this plan 8 full tuition scholarships and 8 half tuition scholar-

ships were awarded to medical students. Eighteen other students were aided by the Federal Emergency Relief Administration.

3. *Graduates.*—Forty-seven graduated with the degree of doctor of medicine. Forty-six of these accepted general rotating internships in 13 hospitals.

4. *Faculty.*—Two full-time appointments to instructorships were made, one in bacteriology and 1 (a former general education board fellow) in neurology and psychiatry. Of a faculty of 97, 17 were full-time teachers as compared with a faculty of 62 in 1929–30, with 3 nominally full-time teachers. Two general education board fellows, 1 in public health and the other in neuroamatomy, have completed their second year of study at the University of Michigan. One of them received the degree of doctor of public health and the other the degree of doctor of philosophy. Their appointments as full-time members of the faculty became effective July 1, 1933–34. One instructor has been granted a fellowship by the Oberlaender Trust for the purpose of advanced study in dermatology and syphilology in Berlin, Germany. One part-time professor was retired after many years of faithful service. There have been 8 scientific publications by members of the faculties and 6 other publications are in the press.

In the absence of budgeted money for travel 8 members of the faculty attended national scientific societies at their own expense. Two represented Howard University by reading scientific papers, resulting from their research, before the Federation of American Societies of Experimental Biologists, the American Society of Physical Anthropologists and the American Society of Mammologists. Three teachers were elected to membership in national scientific societies.

5. *Instruction.*—Although some teachers continue to work without adequate help and equipment there has been surprisingly little serious complaint. Instruction has been furnished to medical, dental, pharmaceutical students, and also to a few from the other colleges, including 16 student nurses in anatomy and to 14 in bacteriology.

6. *Departmental, interschool, and hospital relations.*—Increasing cooperation is noted among the departments of the school, and a very satisfactory series of interchanging lectures has been conducted between the medical and dental colleges and the law school on fields of mutual interest. The relations between the school and hospital remain cordial. On some services in the hospital the clinical material for teaching purposes is adequate in quantity and variety, while in others it is not. Particularly is there a lack of ample clinical material for teaching pediatrics. Facilities for practical teaching of tuberculosis and acute contagious diseases is still lacking. This material should be provided for in the Freedmen's Hospital group.

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COLLEGE OF DENTISTRY

1. *Enrollment.*—Thirty-nine students were registered in the college of dentistry during the school year 1933–34, representing an increase of 1 over the 38 enrolled in 1932–33. There was, however, an increase of 15 in the enrollment of the freshman class, representing the first substantial increase of new students since the college adopted the plan of instruction which requires 2 years of college work for entrance and 4 of professional work for graduation. Two of the new students entered with the bachelor's degree. Several others are pursuing continuation courses leading to both baccalaureate and dental degrees.

3. *Graduates.*—Six graduating students were awarded the degree of doctor of dental surgery at the June commencement. Two former graduates returned during the year for postgraduate work.

4. *Curriculum.*—Official announcement was made of the inauguration of a formal course for the training of dental hygienists during the school year 1934–35 and the first faculty appointment was made looking in this direction. In view of limited facilities and teaching personnel the first class will be limited to 10 students. Qualified applicants already exceed this number.

5. *Faculty.*—The teaching staff continued to include 14 members in 1933–34, 11 of whom were on full-time and 4 on part-time, together representing a full-time equivalent of 12½ teachers. But before the close of the year the staff was weakened by the death of Dr. Frederick P. Barrier, associate professor, a faithful member of the faculty for 28 years. Long-delayed advancement in rank and salaries kept the staff predominantly composed of men in the instructor's rank, the distribution being as follows: Professors, none; associate professors, 3; assistant professors, 1; instructors, 10. (7 full-time and 3 part-time).

Scientific papers, resulting from the research of the dean of the college, were read before the American Association for the Advancement of Science and the International Association of Dental Research, abstracts appearing in 2 scientific journals.

6. *Physical plant.*—Numerous handicaps and inconveniences in connection with the old medical building now used for dentistry have continued to cause the efficiency of the organization to suffer. During the year some progress was made toward overcoming these by a renovation project financed by the Public Works Administration. At the close of the year, however, this project was incomplete. The age and general condition of this building will not permit the best modern work in dentistry to be done in it. The cause of dental education will be greatly served when an urgently needed building with modern equipment is made available.

COLLEGE OF PHARMACY

1. *Registration.*—Twenty-two students registered in the college of pharmacy; 9 in the first year and 4 in the second year of the 4-year course; 2 in the junior and 7 in the senior years of the 3-year course.

2. *Graduates.*—Two students graduated from the 3-year course with the degree of pharmaceutical chemist. The other 7 students, still pursuing the 3-year course—2 juniors and 5 seniors—had not completed the work, but must do so by 1936, the last year for conferring pharmaceutical chemist degree.

3. *Faculty.*—The teaching staff of five members remained the same for 1933–34 as 1932–33. There were 2 full-time professors, 1 of whom is vice-dean, 1 associate professor, 1 full-time instructor, and 1 part-time (one-fourth) instructor. Two scientific papers were published by faculty members during the past year, both in the Journal of the American Pharmaceutical Association.

4. *Curriculum.*—The 4-year curriculum leading to the degree of bachelor of science in pharmacy has been revised to conform to the new National Pharmaceutical Syllabus which is official for all boards and colleges of pharmacy.

5. *Equipment.*—On account of the curtailed budget very little equipment was acquired during the year. Reconstruction of lecture rooms, laboratories, supply rooms, and offices by the maintenance department has added greatly to the teaching facilities of the college.

SCHOOL OF LAW

1. *General trends.*—After a favorable report by the examiner of the American Association of Law Schools the school of law at Howard University was elected to full membership in the association, thus ending its probationary period. The school also acquired membership in the Association of Law Libraries through the activity of the acting librarian, and entered into the plan of this organization to operate a law library clearing house for the exchange of duplicate books. The enrollment experienced a further decline and there was a further loss in faculty personnel. The average scholarship of students increased in caliber; the library gained 824 volumes, making a total of 15,237 volumes, thus further crowding the already outgrown space of the school. The trustees voted to move the school to the undergraduate and graduate campus as soon as building space can be available.

2. *Enrollment.*—The total enrollment of the year was 38, as compared with 44 in 1932–33, the decrease being due to the following special factors: (1) the elimination of the part-time school, (2) the marked increase in standards of scholarship, (3) the elimination of 50 percent of the colleges from which students may be accepted, and (4) the acute economic depression among Negroes.

During the year the administration of the school of law made a survey of interest in legal education in 17 of the schools whose students are eligible for admission. It was found that interest is increasing. The administration believes, therefore, that the decline in enrollment has reached its lowest level and that from now on increase will be noted. A new ruling of the accrediting organizations has also increased the number of schools from which students may be admitted.

3. *Graduates.*—Seven graduates received the degree of bachelor of laws in June, as compared with eight for the previous year.

4. *Faculty.*—The faculty of the school of law for 1934 included 11 members, 4 of whom were full-time and 7 of whom were on part-time, together making a full-time equivalent of 5⅝ teachers, distributed as follows: Professors, 4 (2 full-time and 2 part-time); associate professors, 1; assistant professors, 3 (1 full-time and 2 part-time); instructors, 1 (part-time); others, 2 (part-time). Two teachers returned from further study on fellowships at Harvard University, after having earned the degree of doctor of juridical science. One teacher will be away on fellowship at Harvard during the coming year.

RELIGION

1. *Support.*—The school of religion receives no aid from Government appropriation. It is entirely supported from a small endowment and from private gifts.

2. *Organization and curriculum.*—In accord with the previous trustee action the correspondence, evening school, and college of religion courses were discontinued at the beginning of the school year 1933–34, and the school operated solely as a graduate school of religion requiring a bachelor's degree from a standard college for entrance. The 21 students who had already begun their course in the college of religion were permitted to continue their work, but no new students were admitted to this course.

3. *Students.*—The total enrollment for the year was 32, with 11 students registering in the graduate school of religion and 21 continuing their courses in the college of religion.

4. *Faculty.*—The work was conducted by 10 teachers—2 full-time professors, 1 full-time associate professor, and 7 part-time instructors, together representing the full-time equivalent of 5⅗ teachers. One full-time instructor resigned at the end of the first semester to enter the pastorate. At the end of the year the venerable dean of the school of religion retired after a lifetime of service in the field of Negro education, and his successor was elected.

5. *Extension work.*—During the year the faculty conducted the annual convocation for 3 days, the institute for ministers and religious

workers at Kinston, N. C., for 5 days, and 2 teacher-training classes for the Sunday-school teachers of Washington.

6. *Graduates.*—Seven men were graduated in June, one with the bachelor of divinity degree and six with the degree of bachelor of theology.

THE LIBRARIES

1. *Accessions to the book and periodical collections.*—During the year there were 6,930 accessions to the book collection, distributed as follows: General library 5,845, law 824, medicine 261. These accessions included gifts from 36 donors, many of which were very valuable.

The total usable book collection of the university now includes 85,020 volumes exclusive of pamphlets estimated at 35,000, and of the Veterans' Bureau collection, distributed as follows: Medicine 7,528, law 15,235, general library and all other branches, 62,257.

The libraries subscribe for 498 periodicals distributed as follows: Main library 335, medical library 138, law library 25. Two hundred and eighty-one volumes of back issues of periodicals for the departments of the natural sciences were purchased during the year. Five hundred and thirteen volumes of periodicals were bound during the year, including 380 volumes in the main library and 133 in medicine. The main library now has 5,000 volumes of bound periodicals.

2. *Special Negro collections.*—Valuable additions were made during the year to the Moorland Foundation, a special collection of books by and about Negroes. This collection now contains 4,400 books, about 3,000 pamphlets, and 283 bound periodicals. Forty-three volumes of periodicals pertaining to the Negro were bound during the year. There were 15 loans to college and university libraries from this collection during the year.

In 1932–33 the medical library began a collection of reprints of outstanding scientific publications by Negroes in the field of medicine. This unique and valuable collection is growing at a rate far greater than was expected. It received two especially encouraging gifts during the year.

3. *Cataloging.*—Six thousand nine hundred and eighteen volumes were cataloged during the year in the main library and 147 volumes were recataloged.

4. *Circulation.*—In the main library there was a total circulation of 42,922 books during the year, including 844 reserved books, representing an average of 256 books per day. In the medical library there was a total circulation of 35,414 books for the year or an average per day of 118. Three hundred seventy-seven interlibrary loans were made in the general library and 100 in the medical library.

5. *Loans from Veterans' Bureau collection.*—The university received 46 requests for loans from the Veterans' Bureau books made available to Howard University and loans were made to 41 institutions, totaling 29,000 books.

6. *Improvements in organization and service.*—The main library was organized during the year into four divisions: (1) Cataloging, (2) reference and circulation, (3) order and acquisitions, and (4) special Negro collection. This resulted in decided improvements in service and in *esprit de corps.* Work was greatly facilitated also by increased student assistants made available through special scholarship and student-aid funds provided by the university and by the Government.

8. *New library building and the future outlook.*—The new library building in immediate prospect holds hope of release from the crowded space in the present building. This greatly needed advanced step emphasizes, however, the painful inadequacy of our collection of books and periodicals in every division of the university. This has been long recognized and the General Education Board, the Laura Spellman Foundation, and the Carnegie Corporation have endeavored to help the university by gifts for the development of the libraries of the natural sciences, medicine, law, and dentistry. These grants have all now expired. Increased funds for books are greatly needed.

PERSONNEL

1. *The registrar.*—The registrar and his seven assistants continue to conduct the correspondence concerning admissions for all divisions of the university, to keep the student records in all divisions in a manner acceptable to the decisive accrediting agency thereof, to issue official transcripts of records, to develop an accurate classified list of the records of the university, to serve as secretary of five faculties of the university and to perform other valuable committee services. During the year he made a special study of the records of 1,082 freshmen undergraduate students for a 5-year period, correlating the same with the results of the psychological tests, and prepared a graphic chart showing the geographical distribution of the living graduates of the university whose addresses were available.

2. *Student health.*—By reason of the restricted budget of the university the division of student health was obliged to suffer the loss of both of its half-time assistant physicians. The staff this year consisted of 1 full-time physician, 2 nurses, 1 secretary, and 5 part-time student assistants, working in 6 rooms on the second floor of the gymnasium building, 4-room units on the top floor of the men's and women's dormitories and in cooperation with the X-ray unit of the university and the facilities of Freedmen's Hospital. The staff engaged in the following major forms of service: (1) Detailed physical

examination of all entering students, recording all defects and outlining correction; (2) consultation service for all illnesses in which 2,900 voluntary calls were made, including 800 calls of the nurse in the women's dormitories, the service being improved this year by the addition of a psychiatrical consultant and by a revised system of records; (3) early diagnosis of tuberculosis; (4) the care of students confined to bed with illness, including 26 men and 31 women in the dormitory infirmaries for an average period of 4 days each, in addition to 25 student cases cared for in the Freedmen's Hospital and 6 operative cases; (5) the routine conduct of community hygiene; (6) the promotion of health education through several media, including poster service, special health exhibit on cancer control and prevention, etc.; (7) care of athletes; and (8) special inoculation of student candidates for military camps against contagion. The director served as member of the organization committee of the American Student Health Association during the year and the institutional health committee for the conference on fundamental problems in Negro education.

3. *The deans of women and men.*—The dean of women and the dean of men exercise supervision over the dormitories and the general living conditions of the students; with the advice and cooperation of a faculty committee on student activities they also supervise the extra-curricular activities of students; and by personal interviews and otherwise they try to acquaint themselves with and to correct any one of many personal factors which may be obstructing the individual student from able intellectual performance and progress. The dean of men reports that the men students quickly took advantage of the reduced dormitory fees and occupied all space in Clark Hall—the sole men's dormitory—as well as all unused room space in Miner Hall, a temporary administration building. The dormitory enrollment of women was not substantially increased, however.

By reason of the limited budget of the university and the continuing small residence group of women all boarding facilities for men and women were concentrated in the women's dormitories.

The dean of men's studies show that men students living in the dormitories in general maintain a higher average of scholarship and show fewer failures. This is indicative of the fact that even our present poorly equipped men's dormitory affords a helpful stimulus to study. It is hoped that better dormitories may soon be available. Clark Hall is old and expensive to repair and its room furnishings are miserable. The trustees have tried little by little to improve it but it is obvious that it must be replaced at the earliest possible time by a new dormitory affording modern conveniences.

BUILDINGS AND GROUNDS

Through the use of specially appropriated Public Works funds in the amount of $98,811 (actual use $77,801.85) and the assignment of men and materials to the university by the Civil Works Administration, the buildings and grounds of the university were extensively repaired and reconditioned. A further sum of $89,064.48 was spent from private funds of the university, provided by the general education board and the Julius Rosenwald Fund, and from the income of properties previously purchased through extension funds, for the purchase of additional lands and for the improvement of these properties. The total increases in the land resources for the further expansion of the university, provided from these private gift funds, has now reached the value of $1,089,399.25. The trustees have taken immediate advantage of their ownership of these properties to destroy an entire block of tenement houses which were fitted with sanitary facilities of miserably poor quality and otherwise in such a low state of repair as to be unfit for habitation.

TABLE 13.—*Building projects in process, 1933–34*

Number	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building	May 4, 1929	$475,500
5	Construction and equipment of a library building	Feb. 14, 1931	800,000
7	Construction of educational classroom building	do	460,000
8	Construction and equipment of heat, light, and power plant.	Feb. 17, 1933	460,000

The status of the above-listed projects is as follows: Project no. 2—contract for chemistry building let and building under construction; contract for equipment delayed pending Government action on university's request for $150,800 additional to complete the contract under the 68 percent increased costs prevailing on April 9, 1934, when bids were returned. Project no. 7—classroom contract let and building construction well under way. Project no. 8—heat, light, and power plant plans and specifications completed and bids returned; equipment contract held up pending Government decision on the availability of additional money to meet the increased costs under the codes. Project no. 5—library final plans and specifications are almost ready and are expected to be completed in August.

The total amount appropriated by the Congress for buildings at the university, impounded by the Executive and at length restored by the Public Works Administration, was $2,100,000. Since these appropriations—specifically on April 9, 1934—bids have shown building construction costs to have risen by 17 percent and scientific equipment costs to have risen by 68 percent. Thus far the Public

Works Administration has awarded to Howard University an additional sum of $85,500 or approximately 4 percent, in addition to the sums appropriated by Congress, to make possible the construction of these buildings.

FINANCES

The year 1933–34 was the first full year of operation with the reorganized system of finances voted and installed by the trustees. All finances and business administration of the university were concentrated in the treasurer's office, as redefined by trustee statute. All trustee committees formerly engaged in financial supervision of any sort were combined in the finance committee, and the accounting system of the university was operated on a revised basis conforming with a system agreed upon by the American Association of Universities and the American Association of Colleges. The new system worked with great advantage, facilitating current control, economy of expenditure, and a balanced budget.

I submit herewith the treasurer's financial statement (omitted from this summary), audited by certified public accountants, showing the balance sheets of the university with assets, liabilities, and funds as of June 30, 1933. A statement of income and expenditures, from current and capital funds, is included, with a further statement showing the distribution of expenditures from Government appropriations, as at June 30, 1934.

The total assets of the university at June 30, 1934, were $6,450,335.22, exclusive of the unexpended balances of Government appropriations for the chemistry building, the classroom building, the heat, light, and power plant, and the library. Of the total assets $1,089,398.25 represented assets in physical plant extension made possible through private gifts; $861,153.67 represented endowments; $4,280,300.28 represented plant fund assets, exclusive of the unexpended balances of Government appropriations for buildings, as indicated above. The remaining $219,483.02 represented assets of the current fund.

The total income for the year was $1,269,495.94, including current and capital funds. This represents a gross increase of $210,271.08 over the total income for 1932–33. The total income for current expenditures was $950,472.49 representing a slight gross increase over the sum of $937,144.26 for 1932–33. The sum $950,472.49 includes however, a special appropriation from the Federal Government of $77,801.85 for reconditioning and repair of buildings. The actual income for current educational expenses from the Federal Government was $605,874.77 or $26,000 less than the income from the Federal Government for current expenses during 1932–33. There was a decrease also in private income for current expense from $377,606.91 in 1932–33 to $343,618.48 in 1933–34.

The total expenditures for all purposes, current and capital, were $1,200,047.43 as compared with $1,035,269.98 for the previous year, or an increase of $164,177.45. The total expenditures for current purposes, however, were $957,847.59 as compared with $985,482.95 during the previous year, or a reduction of $27,635.36. Attention is respectfully directed to the increase in the amount and percentage expended for administration and to the decrease in the amount and percentage spent for regular operation and maintenance, as well as to slight increase in the amount and percentage spent for the general library. These are trends which the university hopes to maintain.

Once again economical administration has made possible an excess of income over expenditures in the amount of $69,448.51 and a consequent reduction of the current fund deficit from $135,149.70 to $66,189.79.

It will be observed also that the income received from the Federal Government and from private sources was kept at balance, varying only seventy-eight one-hundredths of 1 percent from the percentages planned in the 10-year program.

The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress were expended under the supervision of the Department of the Interior.

FREEDMEN'S HOSPITAL

W. A. WARFIELD, Chief Surgeon

During the period covered by this report the wards of the hospital, like the preceding year, were filled to capacity, and the number of applicants refused admission on account of a lack of beds was greatly in excess of last year.

On the administrative side the work exceeded any previous year. All of the projects made possible by the allotment of $85,000 of the Public Works Administration funds have been completed except one, repairs to the elevator in wing I. This project called for the installation of a new elevator but the funds were sufficient for repairs only, which will make it safe for use for some years to come.

PATIENTS

There were 251 patients remaining in the hospital at the close of the fiscal year 1933, of whom 31 were pay patients, 73 indigent residents of the States, and 147 indigent residents of the District of Columbia. During the year 5,020, including births, were admitted, making a total of 5,271 indoor patients under care, as against 5,139 the preceding fiscal year.

Of the number admitted, including births, 637 were pay patients, 1,387 were indigent residents of the States, and 2,996 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 5,035, of whom 2,649 had recovered 1,908 improved, 144 unimproved, and 334 died, leaving 236 in the hospital July 1, 1934, of which number 36 were pay patients, 59 indigent residents of the States, and 141 indigent residents of the District of Columbia.

The mortality rate for the year was 6.3 percent, notwithstanding 108 died within 48 hours after admission. Autopsies were performed on 30.6 percent of all deaths.

There were 2,208 surgical operations; 1,107 major and 1,101 minor.

In the dental department 3,367 were treated as against 1,951 last year.

Nineteen thousand three hundred and ninety-three were treated in the out-patient department, of whom 7,785 were new patients. Seven thousand three hundred and nine were treated in the emergency

department. This department, like the indoor, was overcrowded. Many applicants could not receive attention because of the small force of employees. It is urgent that additional clerical and social service help be provided for this department.

The following table shows the number of visits to the various clinics:

Clinic	Number of visits	Clinic	Number of visits
Dermatology	1,292	Oral surgery	378
Ear	245	Orthopedic	5,509
Nose	212	Pediatric	2,676
Throat	2,093	Prenatal	1,442
Eye	2,086	Postnatal	251
Urological	5,530	Surgical dressing	7,485
Gynecological	3,726	Minor surgical	1,342
Luetic	3,237	Tubercular	282
Medical	5,290		
Neurological	789	Total	43,865

The total number of patients receiving the benefits of the hospital was 24,664, or 3,015 more than last year.

In conformity with the action of the American Association of Hospital Social Workers, in convention at Kansas City, the social service department will be designated hereafter as the Department of Medical Social Service. As in previous years the coordination of the work in this department with the school of nursing consisted in a course of 16 lectures by the director of social service to the senior nurses. Consideration is now being given by the superintendent of nurses to the assignment of student nurses to this department for observation during their preliminary period.

THE SCHOOL OF NURSING

The graduate personnel in the nursing department must be enlarged, not only to reduce the hours of service to 8, day and night, but because adequate care of the patients makes it imperative.

The duties of a nurse are very taxing and strenuous, and it should not be expected that she can do her best working from 10 to 12 hours a day, which does not allow proper time for recreation and study. The registration of the school by the State nursing board is in danger of cancelation if the hours of duty are not reduced to a daily basis of 8. This is being required of all schools.

To meet this acute situation, 21 graduates are needed and must be provided without delay.

NEEDS

As stated in the last annual report, the outstanding and most urgent need of the hospital is a larger personnel. In the main the care of the sick may be divided into three major groups: First, physical equipment

such as housing, apparatus, and machinery; second, sustenance, such as food, heat, and medication; and third, service, which embodies personnel. Hospitals are classified according to their preparation to meet the requirements along these three lines and the sick can be cared for only in proportion as the institution is equipped to meet their needs. Loss of rating means inadequate care of the ill, and likewise means inability of those who serve them to receive accredited recognition for their service.

The first two elements by which we are judged, physical equipment and sustenance, have been adequately met, but the increase in personnel has in no degree kept pace with the steady growth of the hospital, and as a consequence our standing has been jeopardized. Our most glaring deficiency is in the nursing department, were 21 additional graduates must be employed in order that the patients may receive the minimum of required care, and that the hours of duty for the nurses, according to standard requirements, may be reduced to a daily basis of 8 hours. Twenty-six thousand four hundred and sixty dollars are required for this need.

Other employees of whom we are in great need in order to satisfy the demands of minimum standards are: 4 residents, 1 clerk, 1 matron, 4 orderlies, and 1 maid. Eight thousand seven hundred dollars will be needed to provide these employees.

The correction of these deficiencies is imperative. The request for these additional employees is not a matter of desire but a matter of demand upon the part of those who set the standards and requirements of the personnel needed to properly care for the hospital sick. The hospital can only attain its true aim and be perpetuated by meeting these requirements.

Statistical summary

	1934					1933				
	Colored		White		Total	Colored		White		Total
	Male	Female	Male	Female		Male	Female	Male	Female	
In hospital July 1, 1932	------	------	------	------	-------	16	18	------	------	34
In hospital July 1, 1933:										
Pay patients	13	18	------	------	31	------	------	------	------	-------
Indigents:										
United States	26	46	1	------	73	38	41	------	------	79
District of Columbia	62	85	------	------	147	64	53	------	------	117
Total	101	149	1	------	251	118	112	------	------	230

Statistical summary—Continued

	1934					1933				
	Colored		White		Total	Colored		White		Total
	Male	Female	Male	Female		Male	Female	Male	Female	
Admitted:										
Pay patients	219	352	------	------	571	253	418	1	------	672
Pay-patient births	29	37	------	------	66	32	34	------	------	66
Indigents:										
United States	402	807	8	3	1,220	407	761	3	------	1,171
District of Columbia	891	1,526	12	2	2,431	878	1,429	10	2	2,319
Births:										
United States	69	96	------	2	167	74	81	------	------	155
District of Columbia	266	299	------	------	565	252	273	------	1	526
Total admitted	1,876	3,117	20	7	5,020	1,896	2,996	14	3	4,909
Total indoor under care	1,977	3,266	21	7	5,271	2,014	3,108	14	3	5,139
Stillbirths:										
Pay patients	1	3	------	------	4	1	2	------	------	3
Indigents	25	20	------	------	45	30	27	------	------	57
Total	26	23	------	------	49	31	29	------	------	60
Discharged, including births:										
Pay patients:										
Recovered	------	------	------	------	412	------	------	------	------	397
Improved	------	------	------	------	207	------	------	------	------	283
Unimproved	------	------	------	------	13	------	------	------	------	9
Total	------	------	------	------	632	------	------	------	------	689
Indigents:										
Recovered	------	------	------	------	2,237	------	------	------	------	1,991
Improved	------	------	------	------	1,701	------	------	------	------	1,733
Unimproved	------	------	------	------	131	------	------	------	------	159
Total	------	------	------	------	4,069	------	------	------	------	3,883
Deaths:										
Pay patients	27	23	------	------	50	27	24	1	------	52
Indigents	153	127	3	1	284	137	127	------	------	264
Total	180	150	3	1	334	164	151	1	------	316
Grand total discharges	------	------	------	------	5,035	------	------	------	------	4,888
In hospital July 1, 1934:										
Pay patients	14	22	------	------	36	13	18	------	------	31
Indigents:										
United States	23	36	------	------	59	26	46	1	------	73
District of Columbia	60	81	------	------	141	62	85	------	------	147
Total	83	117	------	------	200	88	131	1	------	220
Grand total remaining	97	139	------	------	236	101	149	1	------	251
Day's maintenance:										
Pay patients	------	------	------	------	11,416	------	------	------	------	11,237
Indigents:										
United States	------	------	------	------	26,083	------	------	------	------	24,498
District of Columbia	------	------	------	------	50,932	------	------	------	------	49,301
Total	------	------	------	------	88,431	------	------	------	------	85,036

	1934	1933
Cost per patient per day	$2.85	$3.10
Largest number of indigents at any one time	252	249
Smallest number of indigents at any one time	182	168
Daily number of patients, pay and indigent	242	232
Average number of days hospitalization per patient	17	16.48
Daily average number of patients, outdoor	180	138
Number of indigents admitted from District of Columbia, including births	2,996	2,845
Number of prescriptions compounded:		
Indoor	32,807	34,297
Outdoor	23,544	22,397

Financial statement—Receipts and disbursements on account of pay patients

	1934	1933
RECEIPTS		
Private-room patients, at $2 per day	$6,492.00	$6,358.00
Ward patients, at $2 per day (Veterans' Administration)		7,128.00
Ward patients, at $1.75 per day	5,964.00	7,183.25
Children, at $1 per day	239.00	168.00
Babies, at 50 cents per day	163.00	209.00
Use of operating rooms	1,231.00	1,423.00
X-ray photos	395.00	685.00
X-ray photos (Veterans' Administration patients)		520.00
Other charges	48.00	175.00
Other charges (Veterans' Administration patients)		278.00
Total	14,532.00	24,127.25
DISBURSEMENTS		
Subsistence	1,313.90	
Medical and surgical supplies	2,686.47	4,051.35
Miscellaneous (dry goods, repairs, fuel, etc.)	10,239.94	18,001.35
Refund of overpayment by patients	225.25	209.25
Total	14,465.56	22,261.95
Unexpended balance	66.44	1,865.30

Receipts and disbursements, 1934

RECEIPTS	
Appropriation, Interior Act:	
Salaries	$199,270.00
For support	76,860.00
	276,130.00
From pay patients	14,532.00
From Howard University	46,108.63
Total	336,770.63
DISBURSEMENTS	
Miscellaneous, appropriation (fuel, light, clothing, medicine, etc.)	36,666.59
Miscellaneous, pay patient (fuel, light, clothing, medicine, etc.)	12,926.41
Miscellaneous, Howard University (fuel, light, clothing, medicine, etc.)	45,541.44
Subsistence appropriation	39,579.50
Salaries	177,260.88
Pay-patient subsistence	1,313.90
Refunds, pay patients	225.25
Total	313,513.97
UNEXPENDED BALANCE	
Miscellaneous appropriation	193.41
Subsistence	420.50
Salaries (including salary reductions of $17,347.59)	22,009.12
Pay patient	66.44
Howard University	567.19
Unexpended balance, total	23,256.66

THE COLUMBIA INSTITUTION FOR THE DEAF

PERCIVAL HALL, President

During the fiscal year ended June 30, 1934, there were under instruction in Gallaudet College, the advanced department, 142 students, 88 men and 54 women, representing 34 States and Canada. In the Kendall School, the primary and grammar department, there were 70 pupils, 41 boys and 29 girls. There was a net decrease of 2 students during the year, as 44 were admitted and 46 discharged. Sixty-four pupils were from the District of Columbia.

The health of the students was uniformly good, partly no doubt due to preventive inoculations against typhoid, smallpox, scarlet fever, and diphtheria and partly due to special pains taken to provide exercise and good diet, including carefully produced milk from our own dairy.

Regular courses of study in Gallaudet College and Kendall School were continued, with a revival of instruction in bacteriology in the college department for a few selected students.

Studies have been made during the year by competent engineers of the power, light, and heating needs of the institution, of additional buildings needed, and the size and location of these. These studies show that even with the present plant the heating and lighting loads on our power plant are excessive. Crowded conditions call for the construction of a library and recitation building, for which the alumni have already contributed $50,000. Additional funds for a thorough revision and enlargement of the power plant heating and lighting systems and for the additional building mentioned should be provided at an early date.

The salary scale of the employees should be improved, and a research department with at least two workers added. There is a large and valuable field for this type of work, which could be economically and conveniently done in our institution. There is no other place in the world where students are assembled whose age range and educational range, as well as geographical selection, are as wide as those of our pupilage.

The total receipts for the year were $165,701.79; total expenditures, $159,351.42. There was impounded in the Treasury $4,555.54, and

a balance of $1.92 returned unexpended. Expenses from invested funds amounted to $1,446.70.

On presentation day degrees of master of arts in course were conferred on 6 members of the normal department, degrees of bachelor of arts on 10 deaf students of the college, and degrees of bachelor of science on 13. Honorary degrees of master of arts and doctor of humane letters were conferred on Superintendent Thomas Rodwell, Winnipeg, Manitoba, Canada, and Superintendent J. W. Blattner, Sulphur, Okla., respectively.

LIST OF STUDENTS FOR 1934

THE NORMAL DEPARTMENT

California.—Margaret E. Bruns.
Colorado.—Mabel Northern.
Kentucky.—Robert Baughman.
Minnesota.—Stanley D. Roth.
Missouri.—Daniel Pratt Tucker.
South Dakota.—Edward W. Tillinghast.

GALLAUDET COLLEGE

Alabama.—Jones.
Arkansas.—Brown (Norman), Collums, Drake, Goodin, Hirschy, Rountree.
California.—Aho, Brother, Jacobs, Ladner, Layne, Miller (Robert), Naftaly, Norton, O'Branovich, Ott, Vaughn, Watso, Wight.
Colorado.—Culbertson.
Connecticut.—Koziar.
Florida.—Long (Dan), McNeilly, Wilson (Warren).
Illinois.—Burditt, Davis (John), Estes, Holmgren, Hyman, Leicht, Reidelberger, Yeager, Adams.
Indiana.—Fehrman, Whisman.
Iowa.—Crawford, Weisbrod, Parks.
Kansas.—Benoit.
Kentucky.—Logan.
Massachusetts.—Antila.
Michigan.—Paananen, Blackinton.
Minnesota.—Corneliussen, Hillman, Montgomery, Sellner.
Missouri.—Goetter, Lusk, Worsham.
Mississippi.—Davis (Cecil).
Nebraska.—Kelly, Slocum.
New Jersey.—Davidowitz, Higgins, Silverman.
New York.—Caligiuri, Greenmun, Kowalewski, Marshall, Patrie, Slanski, Susco.
North Carolina.—Farnell, Hinnant, Kinlaw, McCord, Parker.
North Dakota.—Berg, Clarke, Marsh, Ottaway, Poyzer, Tollefson, Walford.
Ohio.—Brown (George), Ellerhorst, Franklin, Gefsky, Marino, Miller (Lynn).
Oklahoma.—Tucker.
Oregon.—Grote, Kreplea, Stacks.
Pennsylvania.—Adler, Havens, Hanover, Hoffmeister, Long (Calvin), Mussman, Nichols, Pristera, Sollenberger, Swope, Ulmer.
South Carolina.—Parrott, Wilson (Louise).
South Dakota.—John, Servold, Sorensen.

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Tennessee.—Akin, Boyd, Lucado.
Texas.—Crockett, Davis (Hazel), Gamblin, Hays, Higgs, Zimmerman.
Utah.—Burnett, Curtis.
Virginia.—Golloday.
Washington.—Delp, Mantz, Jozefoski, Nelson, Olsen, Rath, Stanfill, Travis, Vogt.
Wisconsin.—Grabill, Horgen, Kuglitsch, Maertz, Oryall, Ragsdale, Thompson.
Wyoming.—Atkinson, Burdett.
Canada.—Buchan, Paterson.

KENDALL SCHOOL

Illinois.—Frederick Olsen.
Virginia.—Francis Poe.
District of Columbia.—John Adams, Helen Alsop, Byron Baer, Frank Barber, Helen Beavers, Henry Beckert, Edwin Blaisdell, Orval Berrios, Jose Berrios, Marion Bowling, Joseph Cappola, Theodore Chaconas, Ralph Cherrico, Sylvia Cohen, Ruth Colbert, Gilbert Corman, Milton Corman, Hugh Curtiss, Bernard Davidson, Laura Dizon, Milton Dye, Richard Eckert, Maurice Graham, Margaret Hatch, Thelma Henry, Lucille Hillengas, Ralph Hisey, Dixon Hospital, Stanley Jarboe, Valentine Johnson, Robert Johnston, Ida Juenamann, Harold Lomonosoff, Sarah Louck, Lola Lumpkin, Christine Magee, Orville McPherson, Thomas Mead, John Moore, June Moore, Patrick Murphy, Barbara Myer, Vincent Rabbitt, William Ramsey, Myrtle Redman, Patrick Reese, Betty Rice, Mary Riley, Anna Schlegel, Meda Scott, Edna Smoak, Homer Smoak, John Steuchler, Keeny Stewart, Mae Stewart, Georgia Satriakos, Wallace Travland, Mary Tsoulias, Louis Val, George Watson, Betty Wood, Estella Wood, Thomas Zimmerman, Woodrow Zimmerman, Helen Brodkin, J. Edwin Hunter, Robert Miller.

THE ALASKA RAILROAD

(O. F. OHLSON, general manager)

GENERAL REMARKS

The program of improvements and rehabilitation consisting of ditching, bank widening, grade raising and filling in of wooden trestles, and replacing wooden culverts with concrete pipe of the railroad progressed favorably, although it was necessary to utilize maintenance forces during the earlier part of the fiscal year to complete repairs caused by heavy rains and cloudburst that occurred during August 1932; ballasting and bank widening of main track between mile 414 and 443 were, however, commenced as soon as weather conditions permitted at the latter part of fiscal year, which work will be completed by September 15, this year.

Twenty steel drop-bottom coal cars were purchased from the Koppel Manufacturing Co., Koppel, Pa.

Ten convertible ballast and coal cars were purchased from Pacific Car & Foundry Co., Seattle, Wash.

Ten 25-yard air dump cars were purchased from Western Wheeled Scraper Co., Aurora, Ill.

INVESTIGATION AND DEVELOPMENT OF MINERAL RESOURCES

The Alaska Railroad in cooperation with the Alaskan branch of the Geological Survey continued its investigations of the mineral resources in the territory tributary to the railroad and aided projects that would contribute tonnage as well as those that affected the general welfare of the Territory.

One major field project, the examination of the southwestern portion of the Talkeetna Mountains and adjacent to the Willow Creek gold district, was undertaken during the fiscal year 1934. The investigation showed a northeastern continuation of the gold mineralization of the Willow Creek district, but with a tendency for the ore to become lower grade and baser in character. A part of the area is favorable for future prospecting. In addition to the one major field project, numerous examinations of placer and lode prospects extending from Seward to Fairbanks were made. These examinations consisted of the identification of minerals, sampling of veins, and detailed mapping and geologic work to aid further prospecting and development.

An examination of the railroad's coal lease unit no. 7 and plans for its future development as an emergency reserve were made.

Exact figures for the mineral production of the area served by the Alaska Railroad are not available, but it is estimated that during the fiscal year 1934 the total value of the mineral production was over $6,000,000. New developments in the mining industry are given below:

Base ore developments are still at a standstill due to the prevailingly low prices and gold continues to be practically the only metal mined in the railroad belt. Stimulated by the increased gold price, the producing mines increased their capacities, the development of many new properties was started, and the prospecting of new and old areas was prosecuted with increased vigor. Unfortunately, unsettled labor conditions on the waterfronts of Seattle, Portland, and San Francisco handicapped the movement of supplies and equipment necessary for these projects during the latter part of the fiscal year, but the outlook is encouraging for the future.

In the Fairbanks district, prospecting has increased the known area of minable gold-bearing gravels, so that the addition of two new dredges is contemplated. This development will also result in a material increase in the coal production of the railroad belt due to increased power needs. The mechanization of numerous placer gold properties in the Yukon Valley is proceeding vigorously. A number of gold lode properties are meeting with success in their operations and development work in the Fairbanks, Valdez Creek, Willow Creek, Girdwood, and Moose Pass districts. Development work was also started on the Kantishna lead-silver-gold, and the Broad Pass arsenopyrite-gold deposits, which if successful will contribute materially to the tonnage handled by the Alaska Railroad.

AGRICULTURAL DEVELOPMENT

The program of settlement of agricultural lands adjacent to the Alaska Railroad was continued during the year on a lesser scale, because the initial investment and capital necessary as a prerequisite to homesteading in Alaska prevented many from making this venture, and for this reason a personal contact agent was not employed to interest prospective settlers.

During the year, 4 families settled in the Matanuska Valley, and 2 in the Moose Pass district, taking up homesteads comprising a total of 624 acres.

TOURIST TRAFFIC

Tourist traffic remained approximately the same as previous year with an indication of an increase, notwithstanding number of cancelations due to the Pacific Coast longshoremens' strike, and it is the opinion that travel to Alaska will increase each year.

FINANCIAL

Revenue from all sources including nonoperating income was $1,293,684.30, an increase of $77,856.17, or 6.403 percent.

The operating ratio of the railroad decreased from 122.73 in 1933 to 117.26 in 1934.

Total expenses for rail and river boats were $1,471,496.06, a decrease of $21,588.16, or 1.46 percent.

Total deficit for rail and river boat operation and miscellaneous operations was $178,973.33, a decrease of $78,110.40, or 30.38 percent, less $7,371.53 expended fiscal year from $250,000 provided in Appropriation Act of 1932 for continuation of the investigation of mineral and other resources. Therefore, the annual deficit amounted to $171,601.80.

There was a decrease of 3,967 tons in rail line tonnage during 1934 from the previous year, with an increase of $74,669.78 in revenue over the previous year.

The decrease in tonnage was due to reduction in commercial coal shipments, which decreased 6,998 tons under previous year and carries a low rate. The increase in revenue was due to the increased shipments of l.c.l. merchandise, lumber, gasoline, oils, and outbound fish, which commodities carry a much higher rate.

The pay roll for 1934 amounted to $1,242,700.40, an increase of $77,236.33 over the previous year.

GENERAL BUSINESS CONDITIONS AND OUTLOOK FOR TRAFFIC IN FUTURE

Placer and dredging operations in the Fairbanks district and other sections adjacent to the railroad indicate increased and continued activities. A water shortage in 1933 seriously affected the output of the placer workers. The outlook for the year 1934 is very favorable, considering the price received for gold and indications of sufficient water for operations.

Quartz mining activities in the Willow Creek district is on the increase with several good producing properties now in operation.

At the present time there are no apparent indications of increases in general business in any other lines for the coming fiscal year.

THE PERRY'S VICTORY MEMORIAL COMMISSION

(Webster P. Huntington, President)

The Fourteenth Annual Report of the Perry's Victory Memorial Commission to the Secretary of the Interior for the fiscal year ended December 1, 1933, described the condition of the memorial and its site as satisfactory in regard to preservation and use by the public, but pointed out the necessity of certain improvements to the property and other disbursements deemed indispensable in consequence of the reduced revenues of the memorial during the two preceding seasons.

The improvements and disbursements were specified in a request for an appropriation by Congress in the sum of $25,025 for specific objects, to wit: For the construction of a concrete retaining and sea wall along the north front of the memorial grounds and present highway, $18,400; for repairs to the concrete retaining wall and walkway along the south front of the memorial grounds, $1,200; for expenses incurred by the Commission in connection with the contract to change the drainage system of the memorial, $2,000; for expenses incurred in connection with the contract to install the electric-lighting system of the memorial as authorized by Congress and duly carried out, $2,465; for a new electric elevator cable, $570; for the installation of a ground switch in connection with the electrical transformers on the memorial grounds, to guard against leakage of electric current, $215; for repairs to the lightning-protection system of the memorial and premium on 5-year bond against damage from lightning, $175; in all, $25,025.

In April 1934 the request of the Commission for such appropriation by Congress was withdrawn upon a grant of $25,025 in a lump sum by the Federal Administration of Public Works for the purposes named, which, June 20, 1934, were authorized to include $450 for administrative expenses. Under this grant the Commission, on June 23, 1934, let contracts under competitive bidding to Alfred Schnurr, general contractor, of Sandusky, Ohio, for construction of the proposed north retaining wall in the sum of $17,100 and for repairs to the south wall in the sum of $1,100. At the time of filing this report execution of the first-named contract is nearing completion and the second is in progress. Contracts have also been let to and performed

by the Otis Elevator Co., of Cleveland, Ohio, for installation of new elevator cables in the sum of $666.89 and the Ohio Public Service Co. for the proposed ground switch in the sum of $215. Other disbursements and work under the allotment are in progress of negotiation to cover within a reasonable time the remaining objects contemplated.

The season of 1933 at the memorial May 30 to September 14, resulted in total receipts from operation of $2,527.45 and total expenditures of $2,526.62 Total indebtedness from operation during that season and the preceding two seasons was at the time of filing the report approximately $2,000, and there was a so-called "standing indebtedness" due on contracts for changing the drainage system and installing the electric light plant and constructing a souvenir stand of $5,005, which will be reduced to $540, for the souvenir stand only, by application of the Public Works Administration grant to payment of the other amounts due.

While complete figures for operation during the season of 1934 are not available at the time of filing this report, the revenues to date indicate for the season an increase of approximately 20 percent as compared with the previous season and a reduction of 20 percent in operating cost. Of the total receipts the Commission will be able to pay a substantial amount for reduction of indebtedness due to operation during the two preceding seasons.

THE ADVISER ON ECONOMIC STATUS OF NEGROES

CLARK FOREMAN

The Adviser on the Economic Status of Negroes has advised the Secretary of the extent to which Negroes are participating in the recovery program and work of the Department. The Adviser has made investigations and has been consulted by numerous persons other than the Secretary, to the end of securing the maximum benefits to the Negro population and the placement of qualified Negroes in the various services of the Department.

In accordance with the orders of the Secretary, the Adviser has sought to integrate Negroes into the work of the Department and also to bring to his attention instances of discrimination. The Adviser has also been called on by other parts of the Government for help and counsel. At the suggestion of the Secretary he called together an interdepartmental group to discuss special problems of Negroes which exceed the scope of any one department.

Numerous protests and requests for information have been handled by the Adviser and an attempt made to correct misunderstandings and to adjust any abuses that may have occurred.

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